LISTEN.
THINK.
SOLVE.®

INTEGRATED PRODUCTION & PERFORMANCE SUITE

Performance & Visibility

FactoryTalk® View Machine Edition

USER'S GUIDE

PUBLICATION VIEWME-UM004H-EN-E–July 2011
Supersedes Publication VIEWME-UM004G-EN-E

Allen-Bradley • Rockwell Software

Rockwell Automation

Contact Rockwell

Customer Support Telephone — 1.440.646.3434
Online Support — http://www.rockwellautomation.com/support/

Copyright Notice

© 2011 Rockwell Automation, Inc. All rights reserved. Printed in USA.

This document and any accompanying Rockwell Software products are copyrighted by Rockwell Automation, Inc. Any reproduction and/or distribution without prior written consent from Rockwell Automation, Inc. is strictly prohibited. Please refer to the license agreement for details.

Trademark Notices

Allen-Bradley, ControlLogix, Data Highway Plus, DH+, Data Highway II, FactoryTalk, Logix5000, PanelBuilder, PanelView, PLC-2, PLC-3, PLC-5, Rockwell, Rockwell Automation, Rockwell Software, RSAssetSecurity, RSLinx, RSLogix, , RSView, RSView Administration Console, SLC, VersaView, and WINtelligent,are registered trademarks of Rockwell Automation, Inc.

Any Rockwell Automation software or hardware not mentioned here is also a trademark, registered or otherwise, of Rockwell Automation, Inc.

Other Trademarks

ActiveX, Microsoft, Microsoft Access, SQL Server, Visual Basic, Visual C++, Visual SourceSafe, Windows, Windows ME, Windows NT, Windows 7 Professional, Windows Server-, Windows XP, and Vista are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

Adobe, Acrobat, and Reader are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries.

Oracle is a registered trademarks of Oracle Corporation.

ControlNet is a registered trademark of ControlNet International.

DeviceNet is a trademark of the Open DeviceNet Vendor Association, Inc. (ODVA)

Symbol Facotry is a trademark of Software Toolbox.

All other trademarks are the property of their respective holders and are hereby acknowledged.

Warranty

This product is warranted in accordance with the product license. The product's performance may be affected by system configuration, the application being performed, operator control, maintenance, and other related factors. Rockwell Automation is not responsible for these intervening factors. The instructions in this document do not cover all the details or variations in the equipment, procedure, or process described, nor do they provide directions for meeting every possible contingency during installation, operation, or maintenance. This product's implementation may vary among users.

This document is current as of the time of release of the product; however, the accompanying software may have changed since the release. Rockwell Automation, Inc. reserves the right to change any information contained in this document or the software at anytime without prior notice. It is your responsibility to obtain the most current information available from Rockwell when installing or using this product.

Contents

Preface

About the documentation P-1
Finding the information you need P-2
Try the User's Guide and Help first P-2
Information on the Internet P-2
Contacting Rockwell Automation Technical Support P-3

1 • Getting Started

The parts of FactoryTalk View Machine Edition 1-1
Additional software 1-1
FactoryTalk Administration Console 1-1
The FactoryTalk View Machine Edition tools 1-2
FactoryTalk View Studio tools 1-2
FactoryTalk tools 1-3
FactoryTalk Activation Manager 1-3

2 • Exploring FactoryTalk View Studio

Starting and exiting FactoryTalk View Studio 2-1
Starting FactoryTalk View Studio 2-1
Exiting FactoryTalk View Studio 2-1
Opening sample applications 2-2
Exploring the FactoryTalk View Studio main window 2-4
The menu bar 2-4
The toolbar 2-4
The Explorer window 2-5
The workspace 2-5
The Diagnostics List 2-5
The status bar 2-6
Workbook tabs 2-7
Showing and hiding items in the main window 2-8
Using the Explorer window 2-8
Viewing the Explorer window 2-10
Moving and resizing the Explorer window 2-10
Working with editors 2-10
Locating editors 2-10
Viewing an editor's components 2-11

Opening editors . . . 2-11
Closing editors . . . 2-11
Entering information in spreadsheets . . . 2-12
Printing . . . 2-13
Selecting a printer . . . 2-14
Printing at run time . . . 2-15

3 • Planning applications

Understanding the process . . . 3-1
Collecting data . . . 3-2
Designing an HMI tag database . . . 3-2
Collecting information . . . 3-2
Organizing tags . . . 3-2
Planning graphic displays . . . 3-3
Developing a hierarchy of displays . . . 3-3
Creating a template to ensure consistency . . . 3-4
Designing displays . . . 3-4
Usability . . . 3-5
Planning languages . . . 3-5
Planning alarms . . . 3-6
Providing information for the operator . . . 3-6
Local and information messages . . . 3-6
Diagnostics messages . . . 3-6
Planning trends . . . 3-6
Planning recipes . . . 3-7
Designing a secure system . . . 3-7

4 • Working with applications

What is an application? . . . 4-1
Application versus project . . . 4-1
HMI project file . . . 4-1
Run-time application file . . . 4-2
Component files . . . 4-2
External folders . . . 4-2
Default log file locations for PanelView Plus 6, PanelView Plus or PanelView Plus CE applications . . . 4-3
Naming files . . . 4-4
Creating, importing, opening, and closing applications . . . 4-4
Creating applications . . . 4-4
Importing applications . . . 4-5
Opening applications . . . 4-7

Opening multiple applications 4-9
Opening and editing applications from earlier versions of RSView 4-10
Closing applications 4-10
Renaming, copying, deleting, backing up, and restoring applications 4-10
About project settings 4-11
Project window size and run-time screen resolution 4-11
Compact Machine Edition application 4-15
Title bar 4-15
Specifying project settings 4-17
Viewing application properties 4-18
Viewing HMI server properties 4-18

5 • Setting up communications

About OPC communications 5-1
Summary of steps 5-1
About data servers 5-2
Creating data servers 5-3
Setting up RSLinx Enterprise data servers 5-3
Setting up an OPC data server 5-4
Updating data server caches 5-5

6 • Working with tags

Types of tags 6-1
Data server tags 6-1
HMI tags 6-2
The data source 6-2
Basic steps for using tags 6-2
When to use data server tags 6-3
Eliminating duplication 6-3
Using complex data 6-3
Steps for using data server tags 6-3
When to use HMI tags 6-4
Scaling, offsetting, or providing a range for data 6-4
Storing values in FactoryTalk View memory 6-4
Steps for using HMI tags 6-5
Browsing for tags 6-5
Using the Tag Browser 6-6
Showing server names 6-7
Browsing for off-line tags 6-7
Using tags and expressions in your application 6-8
Assigning tags 6-9

Assigning tags to graphic objects 6-9
Using expressions to manipulate tag values 6-11
Substituting tag names used in graphic objects 6-11
Logging tag values 6-12
Using macros to assign values to tags 6-12

7 • Using HMI tags

HMI tag types 7-1
Analog tags that use floating-point values 7-2
How values are rounded 7-2
Using the Tags editor 7-3
Updating the contents of the Tags editor 7-4
Searching for HMI tags 7-4
Data sources 7-5
The data source 7-5
Device 7-5
Memory 7-5
Addressing syntax for device tags 7-5
Organizing HMI tags 7-7
Naming tags 7-7
Using folders to group tags 7-7
Viewing tag statistics 7-8
Other methods for creating HMI tags 7-8
Creating tags as needed in other FactoryTalk View editors 7-8
Creating tags as needed in the Data Log Models editor 7-9
Importing tags from a PLC database 7-9
Using the Tag Import and Export Wizard 7-11

8 • Setting up global connections

About global connections 8-1
Setting up global connections 8-2
Updating the date and time 8-2
Changing displays 8-4
Controlling display changes remotely 8-4
Remote display changes and security 8-4
Setting up remote display changes 8-5
Printing displays 8-5
Closing On Top displays 8-6
Applying parameters to changed displays 8-6
Running macros 8-6
Setting up backlight intensity remotely 8-7

Monitoring run-time RAM usage 8-7

9 • Setting up alarms

About alarms 9-1
Multiple language alarm messages 9-2
Other multiple language alarm features 9-2
Summary of steps 9-2
Setting up alarms 9-3
Preparing to set up alarms 9-3
The data source 9-3
Tags and expressions 9-4
Identifying alarm conditions 9-4
Importing and exporting alarm setup files 9-4
How alarms work 9-4
Alarm triggers and trigger values 9-5
Filtering alarm triggers in multiple languages 9-5
Alarm notification methods 9-6
Displaying alarm information 9-6
Interacting with alarms 9-7
The alarm log file 9-10
Alarm trigger data types 9-11
The Value trigger type 9-11
The Bit trigger type 9-12
The Least Significant Bit (LSBit) trigger type 9-13
Tips for using array tags 9-15
Equivalent data types 9-16
RSLinx Enterprise tag syntax 9-16
KEPServerEnterprise tag syntax 9-17
Creating alarm messages in multiple languages 9-17
Optional alarm connections 9-17
Connections that work with a specific alarm trigger 9-18
How the Handshake connection works 9-18
How the Ack connection works 9-19
How the Remote Ack connection works 9-19
How the Remote Ack Handshake connection works 9-21
Ensuring alarm messages are read by the data source before sending new messages . . . 9-21
Methods of alarm message handshaking 9-21
Holding the message for a specific period of time 9-21
Holding the message until the data source acknowledges that it has read the message 9-22

How messages are queued 9-22
How the Message connection works 9-23
How the Message Notification connection works 9-23
How the Message Handshake connection works 9-23
Connections that apply to all alarms 9-23
How the Silence connection works. 9-24
How the Remote Silence connection works 9-24
How the Remote Ack All connection works 9-24
How the Status Reset connection works. 9-25
How the Remote Status Reset connection works 9-25
How the Close Display connection works 9-25
How the Remote Close Display connection works 9-25
The [ALARM] display 9-25
The [ALARM BANNER] display 9-26
The [ALARM MULTI-LINE] display 9-27
The [STATUS] display 9-28
The [HISTORY] display 9-29
Using displays from the library in your application. 9-30
Creating your own alarm display 9-31
Opening and closing the alarm display 9-31
Opening the display 9-31
Closing the display 9-31
How the alarm list graphic object works 9-32
What is displayed 9-32
How the list scrolls 9-33
How the alarm banner graphic object works 9-33
What is displayed 9-34
How the alarm status list graphic object works 9-34
What is displayed 9-35
What happens when the display is opened 9-35
Using buttons with the alarm history and alarm objects 9-36
Alarm buttons 9-36
Linking buttons to objects. 9-37
Key buttons 9-38
Using alarm buttons to acknowledge, silence, clear, and delete alarms 9-38
Acknowledging the selected alarm 9-38
Acknowledging all alarms 9-39
Silencing alarms 9-39
Clearing and deleting messages 9-40
Using alarm buttons to sort alarms and reset alarm status 9-40
Sorting alarms 9-40
Resetting alarm status 9-40

Retaining alarm status 9-41
Changing the alarm status displayed in the alarm status list 9-41

10 • Setting up FactoryTalk Diagnostics

About FactoryTalk Diagnostics 10-1
Browsing diagnostics messages 10-1
How to set up FactoryTalk Diagnostics 10-1
Destinations 10-2
Message routing 10-3
Categories 10-3
Message severities 10-4
Audiences 10-4
Displaying diagnostics messages during application development 10-5
Viewing FactoryTalk Diagnostics log files 10-5
Using the Diagnostics Setup tool 10-6
Logging to an ODBC database 10-7
Routing messages 10-8
Receiving messages from a PanelView Plus 6, PanelView Plus or PanelView Plus CE terminal 10-8
Displaying and printing diagnostics messages at run time 10-8
Using the Diagnostics List Setup editor 10-8
Setting up how messages are displayed and printed at run time 10-10
The [DIAGNOSTICS] display 10-11
Creating your own diagnostics display 10-11
Opening and closing the diagnostics display 10-12
Opening the display 10-12
Closing the display 10-12
How the diagnostics list graphic object works 10-12
What is displayed 10-12
Using buttons with the diagnostics list 10-13

11 • Setting up security

Using security with your application 11-1
If you do not want to use FactoryTalk Security 11-2
If you do not use FactoryTalk View user accounts 11-3
If you use FactoryTalk View user accounts 11-3
Working with the Runtime Security editor 11-3
The DEFAULT user 11-4
Setting up users for 4.00 and later applications 11-4
Setting up users for 3.20 and earlier applications 11-6
Changing RSView 3.20 and earlier user passwords 11-7

Adding 3.20 and earlier users or groups from a Windows domain 11-7
Removing 3.20 and earlier users or groups 11-8
How user accounts and security codes work 11-9
Assigning security to graphic displays 11-9
Providing a way for users to log in and log out 11-12
Logging in 11-12
Logging out 11-13
Logging out automatically 11-13
Preventing unauthorized users from stopping the application 11-14
To prevent unauthorized users from stopping the application 11-14
Additional step for personal computers 11-14
Additional step for PanelView Plus CE applications 11-14
Setting up FactoryTalk Security for your application 11-15
Summary of steps 11-17
Creating FactoryTalk Security users 11-17
Creating FactoryTalk Security user groups 11-19
Setting up security access to the FactoryTalk Directory 11-19
Setting up security access to the application 11-20
Setting up security access to System policies, groups, and users 11-20
Setting up security access to networks and devices 11-20
Specifying which users can back up and restore FactoryTalk Directory and FactoryTalk View applications 11-21
Specifying activities to track for audit purposes 11-21
Specifying policies for passwords, accounts, and FactoryTalk sign-on 11-21
Summary of security features in a sample startup display 11-22

12 • Setting up language switching

About language switching 12-1
The default language 12-2
Summary of steps 12-3
Setting up Windows for language switching 12-4
Installing Windows languages 12-4
Setting up Windows fonts 12-4
Windows locale settings 12-5
Adding languages to the application 12-5
Removing languages 12-6
Exporting application text strings for translation 12-6
Exporting text in Unicode format 12-6
Exporting text to a Microsoft Excel spreadsheet 12-7
Excel spreadsheet file name format 12-7
Exported language string file locations 12-8

Problems exporting 12-8
Translating application text in Excel spreadsheet files 12-9
Translating application text in Unicode files 12-9
File name and format 12-9
Opening the text file in Microsoft Excel 12-10
Saving the text file in Microsoft Excel 12-10
Differences in file format for files saved in Excel 12-11
Saving the Unicode text file in Notepad 12-11
File schema 12-11
Working with pairs of double quotes 12-12
Working with backslashes and new line characters 12-13
Importing text 12-13
Problems importing 12-14
Canceling importing 12-14
Setting up multiple language support for graphic libraries 12-15
Using graphic libraries that support multiple languages 12-15

13 • Setting up display navigation

About display navigation 13-1
Developing a hierarchy of displays 13-1
Testing display navigation 13-3
Using graphic objects to navigate 13-3
Switching languages 13-3
Display type 13-4
Goto display buttons 13-4
Goto configure mode buttons 13-4
Return to display buttons 13-5
Close display buttons 13-6
Display list selectors 13-6
Shutdown buttons 13-7
Controlling display changes remotely 13-7

14 • Creating run-time applications

Specifying startup settings 14-1
Testing your application 14-2
Creating run-time application files 14-3
Creating .mer files for previous versions 14-3
Creating .mer files for PanelViewPlus 14-3
Converting .mer files to development applications 14-3
Converting run-time application files to development applications 14-7

15 • Running applications on a personal computer

Summary of steps 15-1
Moving applications to the run-time computer 15-3
Starting FactoryTalk View ME Station 15-4
Loading and running applications 15-4
Shutting down applications 15-5
What happens when the application shuts down 15-6
Changing application settings 15-6
Editing device shortcuts 15-6
Looking up contact information for technical support 15-7
Setting up FactoryTalk Diagnostics on the run-time computer 15-8
Setting up serial ports for use with KEPServerEnterprise 15-8
Setting up RSLinx Enterprise communication drivers 15-9
Specifying the printers to use at run time 15-10
Specifying startup options for FactoryTalk View ME Station 15-12
Deleting log files on the run-time computer 15-16
Running a newer version of the application 15-16
Deleting log files manually 15-16
Turning off the FactoryTalk Directory Server warning 15-16
Specifying time, date, and number formats 15-17
Using the DeskLock tool 15-17

16 • Transferring applications to a PanelView Plus terminal

Summary of steps 16-1
Starting FactoryTalk View ME Station 16-3
Specifying the driver to use for the transfer 16-4
Setting up a driver for the transfer on the development computer 16-5
Downloading applications and Windows TrueType fonts 16-6
About the download 16-6
Serial downloads 16-6
Uploading applications from the PanelView Plus CE, PanelView Plus or PanelView Plus 6 terminal 16-7
About the upload 16-7
Serial uploads 16-7
Comparing applications 16-8

17 • Using your application

Logging in to a Windows domain 17-1
Logging in to the application 17-2
4.00 and later applications 17-2

3.20 and earlier applications 17-2
What happens when a user logs in 17-3
Problems with logging in 17-4
Changing passwords 17-4
Logging out 17-6
Entering numeric values 17-6
Activating the cursor point 17-6
Ramping numeric values 17-7
Using the numeric pop-up keypad 17-7
Using the numeric pop-up scratchpad 17-8
Using buttons and keys with the numeric pop-up windows 17-8
How values are ramped 17-9
How values are calculated 17-9
Problems with the numeric pop-up windows 17-10
Entering string values 17-10
Using the string pop-up keyboard 17-11
Using the string pop-up character input 17-11
Using the string pop-up scratchpad 17-13
Using buttons and keys with the string pop-up windows 17-13
What is written to the Value connection 17-14
Problems with the string pop-up windows 17-15
Changing tag values 17-15
Viewing tag data 17-17
Viewing alarms and messages 17-19
Viewing information about run-time communication errors 17-20
Changing languages 17-20

18 • Working with components

Editors that have components 18-1
Working with components 18-1
Creating components 18-2
Opening components 18-2
Saving components 18-2
Closing components 18-2
Adding components into an application 18-3
Deleting components 18-4
Removing components 18-4
Renaming components 18-4
Duplicating components 18-5
Printing 18-5

19 • Using graphic displays

About graphic displays and graphic objects 19-1
Before you begin 19-2
Using the Graphics editor 19-3
Creating and opening graphic displays 19-3
Importing and exporting graphic displays 19-5
Tools and tips for working in the Graphics editor 19-5
Using context menus 19-6
Using the toolbars 19-7
Showing displays in grayscale 19-8
Using the grid 19-8
Zooming in and out 19-9
Correcting mistakes 19-10
Testing your displays as you work 19-10
Setting up graphic displays 19-11
Specifying display settings 19-11
About display types 19-12
Resizing displays 19-13
Creating a background for your display 19-13
Using graphic libraries 19-14
Working with Symbol Factory 19-14
To open Symbol Factory: 19-15
To select a graphic: 19-15
Manipulating the graphic: 19-15
Creating graphic libraries 19-16
Using libraries as displays in your application 19-17
Using libraries to store displays with multiple languages 19-17
Location of library components 19-19
Importing images into your application 19-20
Bitmap images that come with FactoryTalk View Studio 19-21
Importing bitmap and JPEG images 19-21
Using the Image Browser to import images 19-23
Using Symbol Factory 19-24
Tips for using images 19-25
Using local messages 19-26
Local messages versus information messages 19-26
Summary of steps 19-27
Using the Local Messages editor 19-27
Preparing to set up local messages 19-27
How local messages work 19-28
Local messages and trigger values 19-29

Creating local messages in multiple languages 19-30
How the local message display graphic object works 19-30
Printing displays 19-30
Printing displays at run time 19-30

20 • Using graphic objects

Types of graphic objects 20-1
About connections 20-2
Illustrating your displays 20-3
Controlling the application 20-3
Starting and controlling processes 20-4
Displaying processes and values graphically 20-5
Working with lists, trends, alarm banners, and numeric input objects 20-6
Entering and displaying numeric and string values 20-8
Displaying alarms and messages 20-9
Selecting tools for creating graphic objects 20-10
Before you begin creating objects 20-11
Creating graphic objects 20-11
Creating drawing objects 20-12
Creating text 20-12
Creating images 20-14
Creating panels 20-15
Creating arcs and wedges 20-16
Creating ellipses and circles 20-17
Creating freehand shapes 20-17
Creating lines 20-17
Creating polygons and polylines 20-18
Creating rectangles and squares 20-19
Creating rounded rectangles and squares 20-19
Using .wmf and .dxf files 20-21
Using ActiveX objects 20-21
Tools and tips for working with objects 20-23
Selecting and deselecting objects 20-23
Using the Object Explorer 20-24
Highlighting objects in the Object Explorer 20-25
Using the Properties dialog box 20-26
Using the Property Panel 20-29
Setting up properties 20-29
Assigning tags and expressions to an object's connections 20-30
Coloring objects using the color toolbars 20-31
Naming objects 20-32

Testing how objects look in different states 20-33
Assigning tags and expressions to graphic objects 20-34
Assigning tags 20-34
Using expressions to manipulate tag values 20-35
Replacing tags using tag substitution 20-36
Using tag placeholders 20-37
Performing basic operations on objects 20-38
Moving objects 20-39
Copying objects 20-40
Duplicating objects 20-41
Resizing objects 20-42
Reshaping drawing objects 20-43
Deleting objects 20-44
Working with groups of objects 20-45
Grouping and ungrouping objects 20-45
Editing groups of objects 20-46
Editing objects within a group 20-46
Arranging objects 20-47
Layering objects 20-48
Aligning objects 20-49
Spacing objects 20-51
Flipping drawing objects 20-52
Rotating drawing objects 20-52
Locking objects into position 20-53

21 • Setting up graphic objects

Setting up objects' spatial properties, names, and visibility 21-2
Tips for setting up objects with states 21-3
Copying and pasting properties from one state to another 21-3
Adding and removing states 21-3
Setting up how objects are used at run time 21-4
Positioning objects for touch screens 21-4
Using touch margins 21-4
Assigning function keys to buttons 21-5
Function key equivalents 21-6
Using the keyboard to navigate to and select objects 21-7
What input focus looks like 21-8
Using the keys on the keyboard or keypad 21-8
Removing objects from and adding objects to the tab sequence 21-8
Linking buttons to objects 21-9
Repeating a button's action by holding down the button 21-11

Ensuring values are read by the data source before sending new values 21-12
Methods of Enter key handshaking 21-12
Holding the value for a specific period of time 21-13
Holding the value until it is acknowledged 21-13
Time, date, and number formats for graphic objects 21-15
Setting up buttons 21-16
Buttons described later in the chapter 21-18
How to use push buttons 21-18
Setting up momentary push buttons 21-19
Setting up maintained push buttons 21-21
Setting up latched push buttons 21-22
Setting up multistate push buttons 21-24
Setting up interlocked push buttons 21-25
Setting up ramp buttons 21-27
Setting up numeric displays 21-28
How values are displayed 21-28
Problems with displaying values 21-28
Setting up numeric input enable buttons 21-30
Setting up numeric input cursor points 21-31
Setting up string displays 21-33
How values are displayed 21-33
Setting up string input enable buttons 21-34
Setting up goto display buttons 21-35
Setting up close display buttons 21-36
Setting up display list selectors 21-37
How to use indicators 21-39
Setting up multistate indicators 21-39
Setting up symbols 21-41
Setting up list indicators 21-42
How to use bar graphs, gauges, and scales 21-44
Bar graphs make it easy to compare values 21-44
Thresholds change a bar graph’s fill color 21-44
Use bar graphs with scales to show limits 21-44
Gauges make it easy to see limits 21-45
Thresholds change a gauge’s fill color 21-45
Setting up bar graphs 21-46
Setting up gauges 21-47
Setting up scales 21-48
Setting up control list selectors 21-49
Using buttons with the control list selector 21-49
How Enter key handshaking works 21-49
Setting up piloted control list selectors 21-51

Choosing between piloted control list selectors and control list selectors . . 21-51
How piloted control list selectors work at run time 21-51
Setting up local message displays 21-54
Setting up macro buttons 21-56
Setting up time and date displays 21-57
Setting up print alarm history buttons 21-58
Setting up print alarm status buttons 21-59
Setting up alarm lists 21-60
Setting up alarm banners 21-61
Setting up alarm status lists 21-62
Setting up diagnostics lists 21-64
Setting up information message displays 21-65

22 • Animating graphic objects

Types of animation 22-1
Which objects can have which types of animation? 22-2
Using the Animation dialog box 22-2
About the Animation dialog box 22-4
Using Object Smart Path to visually set animation 22-4
Testing animation 22-5
Using tag names and tag placeholders 22-5
Using expressions 22-6
Setting minimum and maximum values 22-6
Defining a range of motion 22-7
Animation that does not use a range of motion 22-7
Using Object Smart Path 22-7
Setting up the different types of animation 22-9
Setting up visibility animation 22-9
Setting up color animation 22-10
Setting up fill animation 22-13
Setting up horizontal position animation 22-13
Setting up vertical position animation 22-14
Setting up width animation 22-14
Setting up height animation 22-14
Setting up rotation animation 22-14
Setting up horizontal slider animation 22-15
Setting up vertical slider animation 22-15
Applying animation to groups 22-16
Checking the animation on objects 22-16
Copying or duplicating objects with animation 22-18
Copying animation without copying objects 22-18

Setting up animation for global objects 22-18

23 • Using expressions

About expressions 23-1
Expressions that result in floating-point values 23-1
Expression components 23-2
Using the Expression editor 23-2
Using the Expression editor versus typing expressions directly. 23-2
Where you can use expressions 23-4
Formatting expressions. 23-4
Using tag names and tag placeholders 23-5
Using tag placeholders instead of tag names 23-5
Constants 23-6
Arithmetic operators. 23-6
String operands 23-7
Relational operators 23-7
How string operands are evaluated. 23-7
Logical operators 23-7
Bitwise operators 23-8
Using the left shift operator 23-9
Evaluation order of operators 23-10
Mathematical functions 23-13
Security functions. 23-14
Language function 23-14
If-then-else 23-16
Nested if-then-else 23-17
Using write expressions 23-18

24 • Using embedded variables

About embedded variables 24-1
Where you can create embedded variables 24-2
Creating embedded variables 24-2
Embedded variable syntax 24-3
Numeric embedded variable syntax 24-3
String embedded variable syntax 24-4
Time and date embedded variable syntax. 24-6
How embedded variables are updated at run time 24-6
How embedded variables are displayed at run time. 24-7
Numeric embedded variables 24-7
String embedded variables 24-8
Time and date embedded variables. 24-8

25 • Using parameters and global objects

Using tag placeholders 25-1
Summary of steps 25-3
Creating parameter files 25-4
Using the Parameters editor 25-5
Using global objects 25-10
Creating global object displays and base objects 25-11
Creating reference objects 25-12
Setting up reference objects' link properties 25-13
Deleting the base object 25-14
Using global object parameters 25-14
Using process faceplates 25-17

26 • Setting up data logging

Summary of steps 26-1
Data log files 26-1
Data Log Models 26-2
Creating Data Log Models 26-2
Data storage locations 26-3
Data logging methods 26-3
Tags in the data log model 26-4
Changing the data log model used at run time 26-4
Displaying data logs using the trend graphic object 26-5
Problems with data logging 26-5

27 • Using information messages

About information messages 27-1
Information messages versus local messages 27-1
Summary of steps 27-1
Using the Information Messages editor 27-2
Setting up how information messages are displayed 27-3
Preparing to set up information messages 27-3
The data source 27-3
Identifying the tags and values to monitor 27-3
How information messages work 27-4
Information messages and trigger values 27-5
Creating information messages in multiple languages 27-5
The [INFORMATION] display 27-6
Creating your own information message display 27-7
Opening and closing the information message display 27-7

Opening the display 27-7
Closing the display 27-7
How the information message display graphic object works 27-7
What is displayed 27-8
Changing the message file used at run time 27-8

28 • Setting up trends

About trends 28-1
Current versus historical data 28-2
Time, date, and number formats 28-3
Summary of steps 28-3
Creating trend objects 28-3
Setting up trends 28-4
The parts of a trend 28-5
Trend border 28-5
Trend window 28-5
Chart 28-6
Y-axis 28-6
Vertical axis labels 28-6
X-axis 28-6
Horizontal axis labels 28-6
Pens 28-6
Pen icons 28-7
Pen markers 28-7
Chart types 28-7
Standard vs. XY Plots 28-7
Isolated graphing 28-8
Plotting a value across the full width of the chart 28-8
Choosing trend colors, fonts, lines, and markers 28-9
The trend border color 28-9
The trend window color 28-9
Testing the trend 28-10
Using the Trends graphic library 28-10
Using buttons to control the trend at run time 28-11
Printing trend data 28-12
Improving clarity of the trend printout 28-12
Run-time errors for the trend 28-12

29 • Setting up RecipePlus

About recipes 29-1
Summary of steps 29-2

How the recipe system works 29-2
RecipePlus selector 29-2
RecipePlus table 29-2
RecipePlus button 29-3
Number format 29-4
Numeric limits 29-4
Specifying the run-time file location 29-5
Storing files outside the HMI project 29-5
Storing recipe files with the HMI project 29-6
Setting up recipe files 29-6
Comparing recipes 29-8
Time and date formats 29-9
Printing recipes 29-9
Creating RecipePlus objects 29-10
Testing RecipePlus objects 29-10
Using the RecipePlus_Components graphic library 29-11
Using buttons with recipe objects 29-12
Viewing data values that are saved at run time 29-13

30 • Using macros

Using macros to assign values to tags 30-1
Using the Macros editor 30-2
When to use macros 30-2
Running macros when tags or expressions change value 30-3
Where to assign macros 30-4

A • Converting PanelBuilder 1400e applications

Terminology A-1
Summary of steps A-2
Converting PanelBuilder 1400e application files A-2
Equivalent graphic objects A-5
Unsupported graphic objects A-8
Unsupported settings and controls A-8
Controls for transferring run-time application files A-8
Settings and controls for alarms A-8
Invalid characters in screen names A-9
Screen security settings A-9
Block tags A-9
Converting non-RIO communications A-9
Unsupported tag data types A-9
Unsupported initial values A-10

Converting RIO communications A-10
Unsupported PanelBuilder 1400e RIO tags A-11
Unsupported graphic object features A-12
Converting expressions A-13
Equivalent expression syntax A-14
Unsupported expression syntax A-15
Order of precedence A-16

B • Converting PanelBuilder and PanelBuilder32 applications

Terminology B-1
Summary of steps B-2
Converting PanelBuilder application files B-2
Equivalent graphic objects B-5
Unsupported graphic objects B-6
Unsupported settings and controls B-7
Settings and controls for alarms B-7
Invalid characters in screen names and tag names B-7
Time and date B-7
External fonts B-7
Screen security settings B-7
Power-up options B-7
Converting non-RIO communications B-8
Tags for unsupported communication protocols B-8
Bit array tags B-8
Converting RIO communications B-9
Unsupported PanelBuilder RIO tags B-9
Unsupported graphic object features B-10

C • System tags

Alarms C-1
Graphics C-1
Time C-2
User C-3

D • ODBC database schema

FactoryTalk Diagnostics log table D-1

E • Importing and exporting alarm XML files

About XML E-1

Creating alarm XML files by exporting E-1
Editing XML files E-2
Saving XML files in Notepad E-2
Testing XML files E-2
Importing XML files E-3
Error log file E-3
Importing alarm XML files E-3
Alarm setup XML file structure E-3

F • RFC1766 names

Mapping languages to RFC1766 names F-1

G • Features supported in different versions of FactoryTalk View

Which versions are supported G-1
Creating run-time application files for previous versions G-2
Features that are not supported in version 5.10 or earlier G-2
Features that are not supported in version 5.00 or earlier G-2
Features that are not supported in version 4.00 or earlier G-4
Features that are not supported in version 3.20 or earlier G-5
Features that are not supported in version 3.10 or earlier G-6

H • Importing and exporting graphics XML files

About XML H-1
Creating graphics XML files by exporting H-1
Editing XML files H-2
Saving XML files in Notepad H-2
Testing XML files H-2
Importing XML files H-3
Error log file H-3
Importing graphics XML files H-3
Graphics XML file structure H-3

Preface

FactoryTalk® View Machine Edition is a member of the FactoryTalk View family of products. It is an integrated package for developing and running automation applications.

Designed for use with the following operating systems or terminals:

- Windows 7 Professional with Service Pack 1 (32-bit)
- Windows 7 Professional with Service Pack 1 (64-bit)
- Windows XP Professional with Service Pack 3 (32-bit)
- Windows Server 2003 R2 Standard Edition with Service Pack 2 (32-bit)
- Windows Server 2003 R2 Standard Edition with Service Pack 2 (64-bit)
- Windows Vista Business with Service Pack 2 (32-bit)
- Windows Vista Home Basic with Service Pack 2 (32-bit)
- Windows Server 2008 Standard Edition with Service Pack 2 (32-bit)
- Windows Server 2008 Standard Edition with Service Pack 2 (64-bit)
- Windows Server 2008 R2 Standard Edition with Service Pack 1 (64 -bit)
- PanelView™ Plus and PanelView Plus CE terminals running Microsoft Windows CE 4.1
- PanelView Plus 6 terminals running Microsoft Windows CE 6.0

FactoryTalk View Machine Edition gives you all the tools you need to create effective machine-level monitoring and control applications.

About the documentation

The FactoryTalk View Machine Edition documentation set includes:

- *Release Notes:* Information to read before you begin installing or working with the software.

  The Release Notes are available on the FactoryTalk View Machine Edition DVD, as well as from the Help menu in FactoryTalk View Studio.

- *FactoryTalk View Machine Edition Installation Guide:* A guide to installing and activating the various components of FactoryTalk View Machine Edition.

  The Installation Guide is available on the FactoryTalk View Machine Edition DVD, as well as from the Help menu in FactoryTalk View Studio.

- *FactoryTalk View Machine Edition User's Guide:* Comprehensive information about FactoryTalk View Machine Edition, procedures for creating and running an automation application, and reference information.

  The User's Guide is also available on the FactoryTalk View Machine Edition DVD, as well as from the Help menu in FactoryTalk View Studio.

- *Help:* Online procedures and reference information.

  Help is available from the Help menu in FactoryTalk View Studio.

Finding the information you need

You have many options for finding information about how to use FactoryTalk View, or how to solve problems with FactoryTalk View.

Try the User's Guide and Help first

The User's Guide and Help provide comprehensive information about typical uses of FactoryTalk View. Chances are, your question is answered in the documentation.

To find the answer, use the table of contents and the index in the User's Guide and Help.

You can also perform a full-text search on both the Help and the User's Guide. For information about using Help, see Chapter 5, "Getting the information you need," in the *FactoryTalk View Machine Edition Installation Guide*.

For information about performing searches on the User's Guide, see Adobe® Reader® Help.

Information on the Internet

If you can't find the answer to your question or problem in the User's Guide or Help, you can find information on the World Wide Web.

You can connect to the Rockwell Automation® web site from within FactoryTalk View Studio. To do so, you must have a web browser installed on your computer, and you must have an active Internet connection.

To connect to web sites from FactoryTalk View Studio

- On the Help menu, select Rockwell Automation on the Web, and then click the name of the web page you want to view.

The Rockwell Automation Knowledgebase

The Knowledgebase web page leads to a comprehensive, searchable database of support information for all Rockwell Automation products.

Contacting Rockwell Automation Technical Support

If you can't find the answer to your question using any of the resources suggested above, contact Rockwell Automation Technical Support at:

Telephone: 440-646-3434

World Wide Web: http:///www.rockwellautomation.com/support

Support staff are available Monday to Friday from 8 AM to 7 PM Eastern Standard Time (North America only), except on statutory holidays.

When you call

When you call, be at your computer and be ready to give:

- the product serial number.

  You'll find this number on the Activation disk label and in the About FactoryTalk View Studio dialog box available from the Help menu in FactoryTalk View Studio.
- the product version number.
- the type of hardware you are using.
- the exact wording of any messages that appeared on your screen.
- a description of what happened and what you were doing when the problem occurred.
- a description of how you tried to solve the problem.

You may also be required to provide information about the FactoryTalk View add-ons and updates that are installed on your computer.

To view the list of installed add-ons and updates

1. In FactoryTalk View Studio, click Help, and then click About FactoryTalk View Studio.
2. To view the list of installed add-ons, click Add-Ons.

Getting Started

FactoryTalk® View Machine Edition is software for developing and running human-machine interface applications. FactoryTalk View Machine Edition is designed for monitoring and controlling automated processes and machines.

For information about installing FactoryTalk View Machine Edition, see the *FactoryTalk View Machine Edition Installation Guide*.

The parts of FactoryTalk View Machine Edition

FactoryTalk View Machine Edition includes two products:

FactoryTalk View Studio is configuration software for developing machine-level applications. This software runs on operating systems such as Windows® 7 Professional, Windows XP Professional, Windows Server 2003 R2, Windows Vista Business and Home Basic, and Windows Server 2008 operating systems.

FactoryTalk View ME Station is a stand-alone run-time environment for machine-level applications. Use FactoryTalk View ME Station to run the applications you develop in FactoryTalk View Studio.

You can run machine-level applications on PanelView™ Plus terminals and PanelView Plus CE terminals with the Windows CE 4.1 terminals as well as PanelView Plus 6 terminals with the Windows CE 6.0 terminals, and on personal computers.

Additional software

The FactoryTalk View Machine Edition DVD also includes three additional software products:

RSLinx® Enterprise™ is a communication server built around FactoryTalk® technology to assist in developing and running your FactoryTalk View ME applications.

RSLinx® Classic™ is software that provides communications to a wide range of communication drivers. RSLinx Classic is an OPC-compliant data server. RSLinx Classic is available for personal computers only.

Adobe® Reader® 10.0.1is software for reading the online *FactoryTalk View Machine Edition User's Guide*. If desired, you can also use the software to print the User's Guide.

FactoryTalk Administration Console

The FactoryTalk Services Platform includes software called the FactoryTalk Administration Console. This software allows you to set up FactoryTalk Security™.

FactoryTalk Security is a method for setting up security for users for multiple Rockwell Automation products in one place.

FactoryTalk Security is intended to improve the security of your automation system by limiting access to those with a legitimate need. FactoryTalk Security authenticates user identities and authorizes user requests to access a FactoryTalk-enabled system. These security services are fully integrated into the FactoryTalk Directory and are included as part of the FactoryTalk Services Platform that installs with many products.

You can also set up FactoryTalk Security in FactoryTalk View Studio. For more information, see Chapter 11.

To open the FactoryTalk Administration Console

- On the Windows Start menu, select Programs > Rockwell Software, and then click FactoryTalk Administration Console.

  For information about using the FactoryTalk Administration Console, see FactoryTalk Help.

The FactoryTalk View Machine Edition tools

FactoryTalk View Studio tools

These tools are installed with FactoryTalk View Studio:

- **Application Documenter** is software that provides detailed information about FactoryTalk applications.
- **Application Manager** is software for renaming, copying, deleting, backing up, and restoring applications.
- **DeskLock** is software that prevents Windows 7 Professional, Windows XP, Windows Server 2003 R2, Windows Vista, and Windows Server 2008 users from exiting the FactoryTalk View application at run time. You can use this tool to set up a customized desktop and to prevent access to Windows functions. You cannot use DeskLock if you are running your application on a PanelView Plus 6, or PanelView Plus, or PanelView Plus CE terminal.
- **FTVIEWUSER Account Reset** is software for resetting the FTVIEWUSER account back to its default.
- **FTView Graphic Strings Search Replace** is software for performing search and replace operations on STRINGS that are contained within graphic displays. STRINGS include: tags, expressions, commands or text assigned to objects.
- **Legacy Tag database conversion** is software for converting your legacy tag database to a new format to work with Microsoft SQL database.

- **Firmware Upgrade Wizard** is software for installing new firmware releases on PanelView Plus, or PanelView Plus CE, or PanelView Plus 6 terminals.
- **ME Transfer Utility** is software for moving a run-time machine-level application (.mer file) from the development computer to PanelView Plus, and PanelView Plus CE, and PanelView Plus 6 terminals.
- **Tag Import and Export Wizard** is software for importing or exporting the FactoryTalk View tag database.
- **Diagnostics Viewer** allows you to view FactoryTalk Diagnostics messages using the Windows Event Viewer.

To start the tools

- On the Windows Start menu, select Programs > Rockwell Software > FactoryTalk View > Tools, and then click the tool to start.

To start the Diagnostics Viewer

- On the Windows Start menu, select Programs > Rockwell Software > FactoryTalk Tools, and then click Diagnostics Viewer.

These tools are also available from the Tools menu in FactoryTalk View Studio.

FactoryTalk tools

FactoryTalk tools are installed when you install FactoryTalk Services Platform. They are available from the Windows Start menu.

To start FactoryTalk tools

- On the Windows Start menu, select Programs > Rockwell Software > FactoryTalk Tools, and then click the tool to start.

FactoryTalk Activation Manager

FactoryTalk Activation Manager is installed when you install FactoryTalk View, if you choose to install the FactoryTalk Activation. It isavailable from the Windows Start menu.

To start FactoryTalk Activation tools

- On the Windows Start menu, select Programs > Rockwell Software > FactoryTalk Activation > FactoryTalk Activation Manager to start.

2 Exploring FactoryTalk View Studio

This chapter describes:

- starting and exiting FactoryTalk® View Studio.
- opening sample applications.
- exploring the FactoryTalk View Studio main window.
- using the Explorer window.
- working with editors.
- entering information in spreadsheets.
- printing information in editors.

For information about working with editors' components, see Chapter 18 in the *FactoryTalk View Machine Edition User's Guide*.

Starting and exiting FactoryTalk View Studio

FactoryTalk View Studio is configuration software for developing machine-level applications. This software runs on the Microsoft® Windows® 7 Professional, Windows XP Professional, Windows Server 2003 R2, Windows Vista Business and Home Basic, and Windows Server 2008 operating systems.

Starting FactoryTalk View Studio

To start FactoryTalk View Studio

- On the Windows Start menu, select Programs, and then click FactoryTalk View Studio.

FactoryTalk View comes with several sample applications. We suggest you open the Malthouse sample application now to use while you try out the instructions in the remainder of this chapter. See the instructions on page 2-2.

Exiting FactoryTalk View Studio

To exit FactoryTalk ViewStudio

- On the File menu, click Exit.

  If there are any unsaved changes in open editors, FactoryTalk View Studio asks you whether to save the changes before exiting the program.

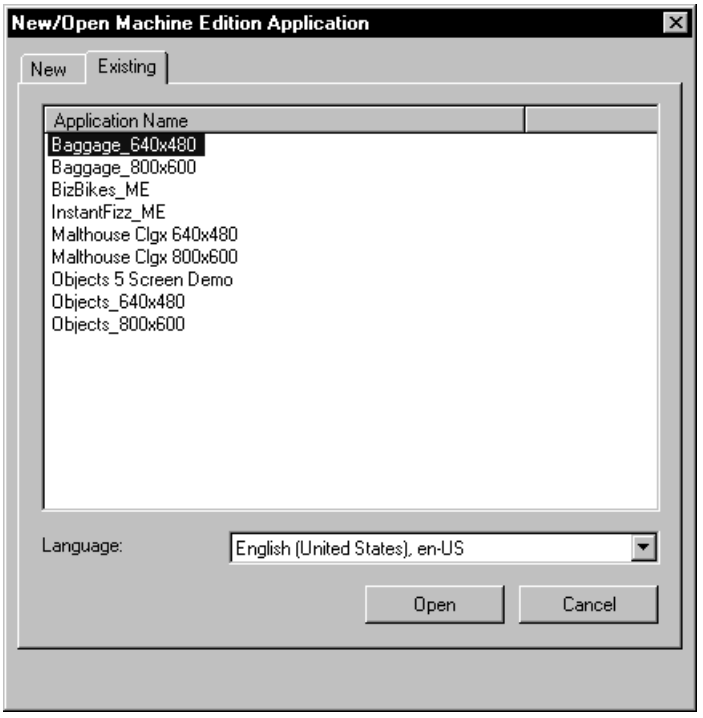
Opening sample applications

The sample applications are designed for two screen resolutions: 640 x 480 and 800 x 600. Select the application that matches the screen resolution of your run-time monitor.

When you first install FactoryTalk View, sample applications are accessible to all users. For information about setting up users and granting them access to applications, see Chapter 11.

To open the Malthouse sample application

1. Start FactoryTalk View Studio.
2. Click the Existing tab.



3. Click Malthouse Clgx 640x480 or Malthouse Clgx 800x600.
4. Specify a language for the application, and then click Open.

   FactoryTalk View Studio displays the sample application in the Explorer window.

Problems opening applications

If you have trouble opening an application in FactoryTalk View Studio, the problem could be a Microsoft Windows security setting. You must have read and write access to the folder that contains the HMI projects. For example, if you belong to the Windows user group called Power Users, and the group does not have write access to the HMI projects folder, you won't be able to open applications in FactoryTalk View.

The default location for the HMI projects folder is:

C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME
(Windows XP or Windows Server 2003 R2)

or

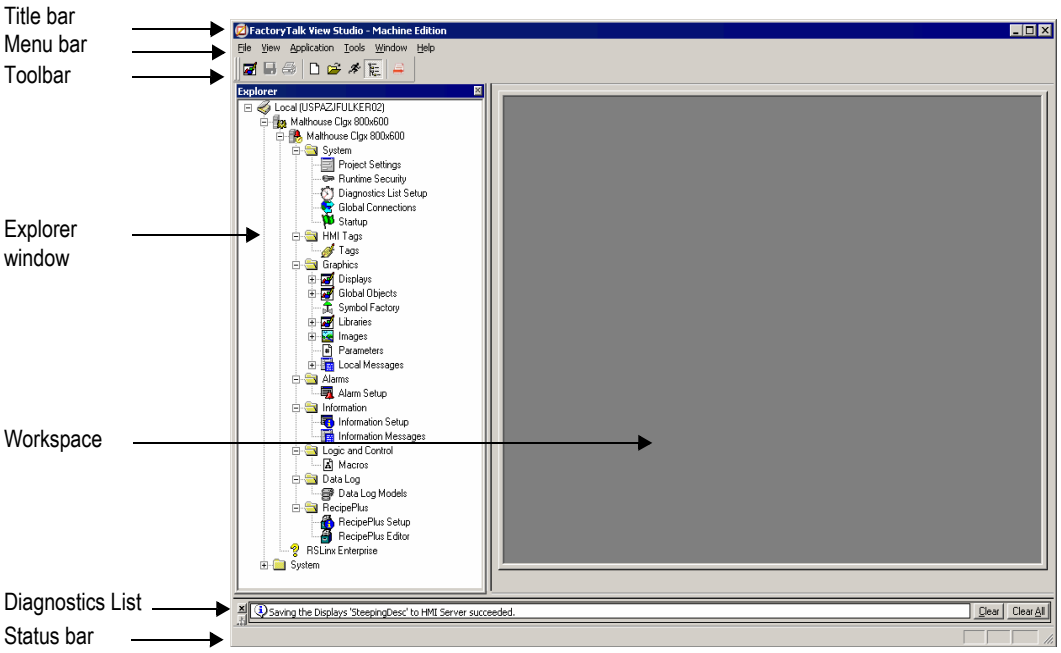
Users\Public\Public Documents\RSViewEnterprise\ME
(Windows Vista, Windows 7 Professional or Windows Server 2008)

For more information about security, see Chapter 11.

To set up write access for any Windows Security Group

1. Right-click the HMI projects folder, and then click Properties.
2. In the Security tab of the Properties dialog box, select a Windows Security Group (ex. Power Users)from the list of groups and user names.
3. In the Permissions box below the list, select Full Control, and then select Allow.

Exploring the FactoryTalk View Studio main window

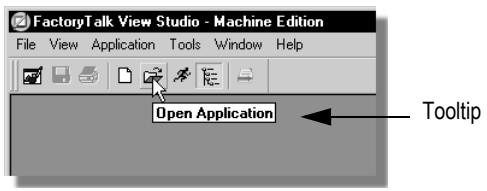


The menu bar

The menu bar contains the menu items for the active window. Each editor has its own set of menus.

The toolbar

The toolbar contains buttons for commonly used menu items so you can have quick access to the items without opening the menu. When you point to a button on the toolbar, the button name is displayed in a tooltip and in the status bar.



All editors use the Standard toolbar. The Graphic Displays, Graphic Libraries, Runtime Security, and Tags editors have additional toolbars.

The Explorer window

The Explorer window has two tabs: the Application tab, and the Communications tab.

The Application tab contains the editors for creating and editing your application. It also contains the System folder for setting up FactoryTalk Security™.

The Communications tab contains the communications tree for the development computer. For more information about using the communications tree, see Help for RSLinx® Enterprise™.

For more information about the Explorer window, see page 2-8. For information about setting up security, see Chapter 11.

The workspace

The workspace is the blank area of the FactoryTalk View Studio window. You can drag icons from the Explorer window to the workspace to open editors and components. For more information, see page 2-8.

The Diagnostics List

The Diagnostics List shows messages about system activities. You can specify the types of messages to display in the Diagnostics List, move the list, resize it, and clear the messages in it.

For information about testing graphic displays, see page 19-10.

Moving the Diagnostics List

You can detach (undock) the Diagnostics List from the main window, and then move the list anywhere on the screen.

To undock the Diagnostics List, drag the grab bars at the bottom left of the Diagnostics List. If you can't see the grab bars, drag the top edge of the Diagnostics List to make it a bit larger.

To detach the Diagnostics List, drag the grab bars.

To prevent the Diagnostics List from docking automatically while you move it across the screen, hold down the Ctrl key on the keyboard while you move the Diagnostics List.

When the Diagnostics List is undocked, you can make it any size you want, for example to view more than one message at a time. To resize the bar, drag an edge or corner until the bar is the size you want.

To re-attach the Diagnostics List, double-click its title bar.

To clear the selected message in the Diagnostics List, click Clear. To clear all the messages in the Diagnostics List, click Clear All.

Messages in the Diagnostics List

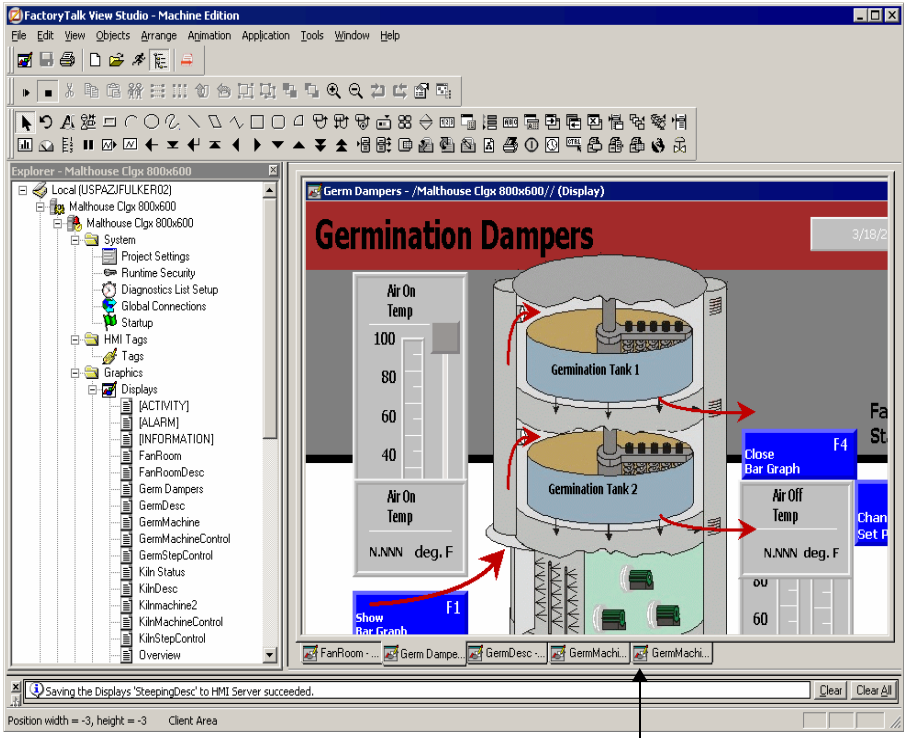
The types of messages that appear in the Diagnostics List depend on how you set up FactoryTalk Diagnostics on the development system. For information about specifying the types of messages to display, see page 10-3.

The status bar

The status bar displays information about the active window or about the selected tool or menu item. The information that is displayed depends on where the mouse pointer is. For example, when you select a graphic object in the Graphics editor, the status bar displays information about the selected object.

Workbook tabs

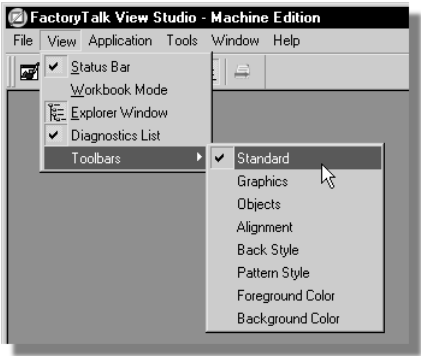
If you select Workbook Mode on the View menu, the workspace displays tabs at the bottom for each open editor or component. Workbook Mode allows you to bring forward an open item more quickly than by using the Window menu.



Showing and hiding items in the main window

You can display or hide all the items in the main window (except the menu bar) by clicking the items on the View menu.

The status bar, Explorer window, Diagnostics List, and Standard toolbar are visible. Workbook Mode is turned off.



To hide or display the Explorer window

- On the View menu, click Explorer Window, or click the Explorer Window tool on the toolbar.

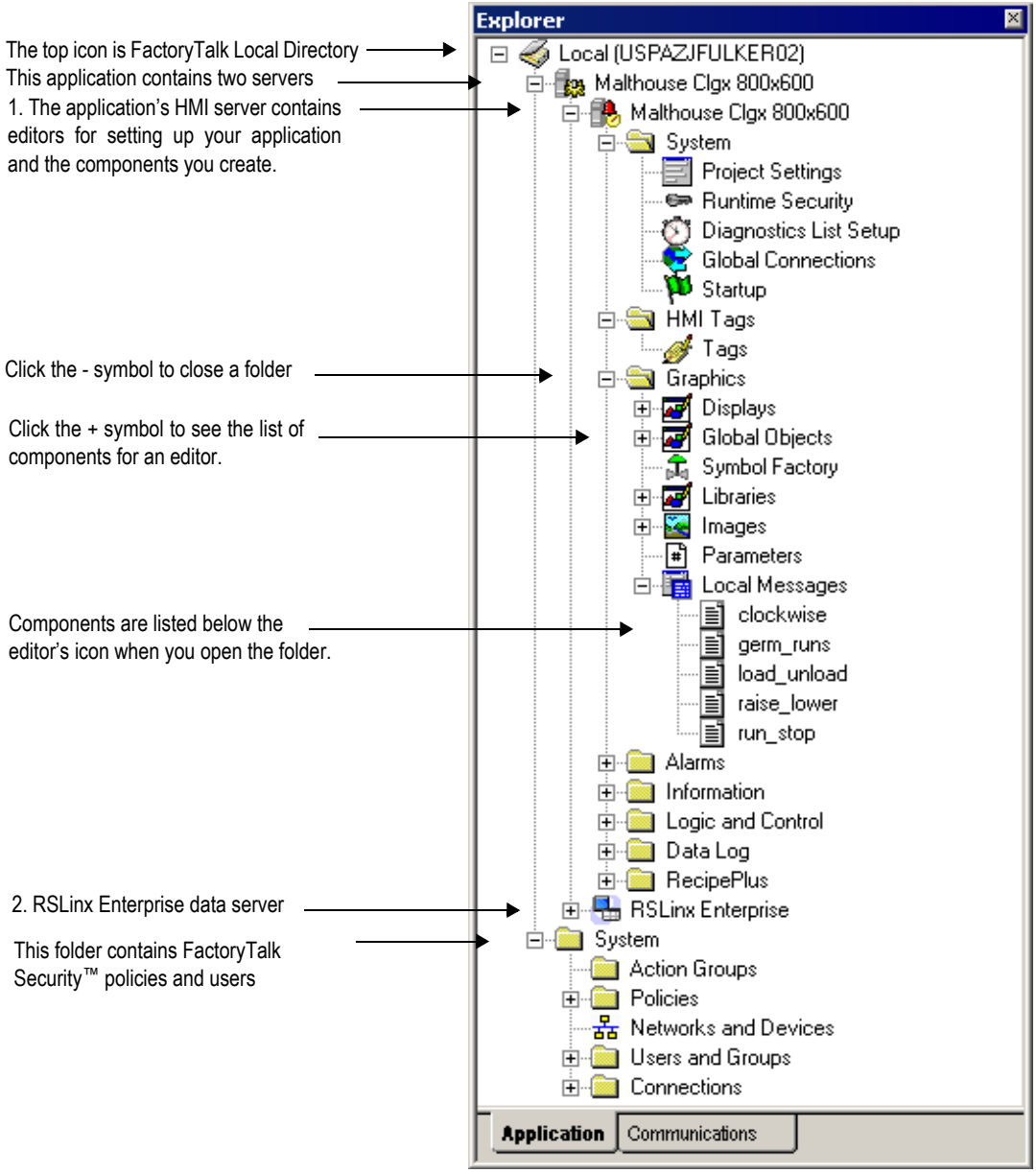
Using the Explorer window

The Explorer window is the main tool for working with FactoryTalk View Studio. It lists the editors you use to develop your application, as well as the components, such as graphic displays, you've created.

Use the Explorer window to set up security for your application. You can use the window to set up users and user groups, and to assign security access to FactoryTalk® Directory to the application, and to networks and devices. For information about setting up security, see Chapter 11.

An application consists of one or more data servers and an HMI project (also known as an HMI server). The data servers provide communications for the project. The project consists of graphic displays, alarm information, user information, and other settings.

This manual generally uses the term application to refer to both application-level and project-level procedures.


The top icon is FactoryTalk Local Directory
This application contains two servers
1. The application's HMI server contains editors for setting up your application and the components you create.
Click the - symbol to close a folder
Click the + symbol to see the list of components for an editor.
Components are listed below the editor's icon when you open the folder.
2. RSLinx Enterprise data server
This folder contains FactoryTalk Security™ policies and users
Explorer
Local (USPAZJFULKER02)
Malthouse Clgx 800x600
Malthouse Clgx 800x600
System
Project Settings
Runtime Security
Diagnostics List Setup
Global Connections
Startup
HMI Tags
Tags
Graphics
Displays
Global Objects
Symbol Factory
Libraries
Images
Parameters
Local Messages
clockwise
germ_runs
load_unload
raise_lower
run_stop
Alarms
Information
Logic and Control
Data Log
RecipePlus
RSLinx Enterprise
System
Action Groups
Policies
Networks and Devices
Users and Groups
Connections
Application
Communications

Viewing the Explorer window

You can view the Explorer window in a number of ways:

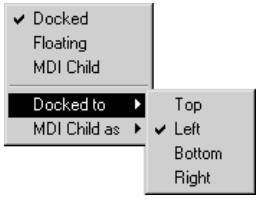
- As a docked window. When docked, the explorer is always on top of other windows that it overlaps. You can dock the explorer to any edge of the main window.
- As a floating window. When floating, the explorer is always on top of other windows that it overlaps, but you can move it to different locations in the main window.
- As a "child" window. When the explorer is in child mode, you can minimize the explorer or position other windows in front of it. This mode is particularly useful when you are working in multiple editors or working with the Help open.

To put the explorer in child mode, right-click the Explorer window title bar, and then click MDI Child.

Moving and resizing the Explorer window

You can move the Explorer window in a number of ways:

- Click the title bar and drag.
- Right-click the title bar, then select a new docking location, floating, or child mode.



You can resize the Explorer window by dragging its edges.

Working with editors

When developing an application, you will use many different editors, but they have many similar features and often require similar information. Knowing how to use these features saves time.

For information on working with particular editors, see the chapters later in this guide.

Locating editors

The editors are grouped in folders in the Explorer window (see the illustration on page 2-9). Each editor is displayed with an icon to the left of the editor name.

To open a folder in the Explorer window

- Click the + symbol to the left of the folder icon, or double-click the folder name.

Viewing an editor's components

With some editors you enter information in a single window or a tabbed dialog box. Other editors allow you to create multiple components, such as graphic displays or message files. Each component is stored in a separate file, with its own name.

You can create components in these editors:

- Graphics (components include graphic displays, global object displays, and graphic libraries, each in their own folder)
- Alarms
- Parameters
- Local Messages
- Information Messages
- Data Log Models
- Macros
- RecipePlus

The Explorer window lists the components you create under the icon for the editor you used to create the component.

Use the Images editor to copy bitmap images into your application (but not to create new images). Each image you copy is listed as a component under the editor.

To view a list of components for an editor

- Click the + symbol to the left of the editor icon, or double-click the editor name.

For information about working with components, see Chapter 18 in the *FactoryTalk View Machine Edition User's Guide*.

Opening editors

To open an editor

- Right-click the editor, and then click Open or New.

  If there are no components in the editor, you can double-click the editor to open it.

Closing editors

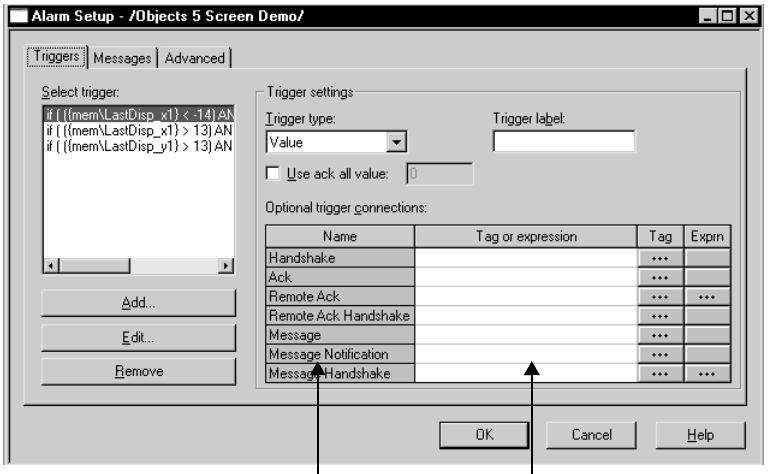
To close an editor

- Click the close button on the editor's title bar, or on the File menu click Close.

Some editors have an OK, Cancel, or Close button that you can click to close the editor.

Entering information in spreadsheets

Some editors contain spreadsheets for entering information. You can enter information in the white columns. Gray columns display information; you cannot enter information in them.



These editors contain spreadsheets:

- Tags
- Runtime Security (formerly User Accounts)
- Global Connections
- Local Messages
- Alarm Setup
- Information Setup
- Information Messages
- Macros
- RecipePlus Editor

In the Graphics editor, many of the Properties dialog boxes for setting up graphic objects contain spreadsheets for assigning tags or expressions to the objects.

To enter information in a cell in a spreadsheet

- Click the cell, and then type the information. If the cell already contains text, the new information is added after the current text.

  In the Property Panel, double-click the cell and then type the information. If the cell already contains text, double-clicking highlights the text and typing replaces the highlighted text.

To move to the next cell in the row

- Press Tab or Enter.

  The method to use depends on which editor you're working in.

To move to the first cell in the next row

- Press Enter or Down Arrow.

  The method to use depends on which editor you're working in.

To delete a cell's contents

- Click the cell, and then press Delete or Backspace. Pressing Backspace removes the characters one by one.

  The method to use depends on which editor you're working in.

To delete rows

- Select one or more rows, right-click the selection, and then click Delete Rows.

Printing

Each editor has a Print item on its File menu.

To print an editor's contents

1. Open the editor.
2. On the File menu, click Print.
3. Click OK.

Selecting a printer

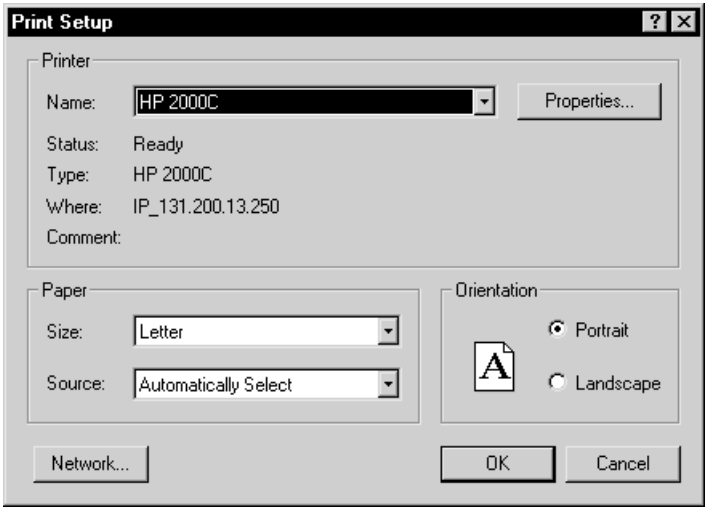
You must install a printer before you can select it. For information about installing a printer, see your Windows documentation.

The Print Setup menu item in FactoryTalk View Studio applies to your development computer only.

To print at run time, set up a printer on the computer or PanelView Plus terminal you'll be using to run your application. For more information about printing at run time, see page 2-15.

To select a printer

1. On the File menu in any editor or component, click Print Setup.



2. If you don't want to use the default printer, specify another printer.
3. Choose the appropriate paper and orientation options.
4. Click OK.

Selecting printer setup options

For detailed information about printer options, refer to your Windows documentation.

Selecting a network printer

FactoryTalk View Studio can print to a network printer. For detailed information about setting up network printers, refer to your Windows documentation.

Printing at run time

Print graphic displays at run time using the display print button or using a remote display print. You can also send diagnostics and alarm messages to a printer at run time.

For information about	See
Display print buttons	page 19-31
Printing graphic displays	page 19-30
Printing displays remotely	page 8-5
Printing alarm messages	page 9-10
Printing diagnostics messages	page 10-8
Specifying the printers to use at run time for Windows 7 Professional, XP, Server 2003 R2, Vista or Server 2008 applications	page 15-10
The type of printer to use with a PanelView™ Plus 6, PanelView Plus or PanelView Plus CE terminal	page 16-1

3 Planning applications

A well-designed application requires planning. To help you plan, this chapter describes:

- understanding the machines and processes you're automating.
- collecting data.
- designing an HMI tag database.
- planning graphic displays and navigating between them.
- planning languages.
- planning alarms.
- providing information for the operator.
- planning trends.
- planning recipes.
- designing a secure system.

FactoryTalk® ViewFactoryTalk® View comes with several sample applications that can give you guidance when planning your application. For instructions on opening the sample applications, see page 2-2.

Understanding the process

Gather information from a variety of sources so you have a complete and detailed understanding of the machines and processes you're automating.

To gather information:

- Talk to machine operators and other experts who are going to use the system. Find out what information they need to optimize machine operations and processes.
- Talk to management and management information systems staff to find out what information they need to support planning decisions.
- Break up each section of the process into its constituent parts.
- Determine what type of communications you'll be using—which network types, data servers, and devices.
- Determine which process variables you need to have access to and identify their locations in the programmable controllers.

Collecting data

When planning data collection, design your system so only essential data is collected. Limiting data collection is important because collection activities require substantial processing power and generate a lot of traffic on the network.

Keep data collection requirements in mind when designing the layout of the programmable controller data tables and the HMI tag database. Ideally, tag addresses reference contiguous blocks of programmable controller data tables to reduce highway traffic and optimize system response. If you're going to use data from an OPC® server, read the server documentation to find out how to optimize traffic.

Designing an HMI tag database

Take the time to plan your HMI tag database. A good design helps reduce the time required for maintenance and can improve programmable controller-to-FactoryTalk View response time.

For information about creating HMI tags, see Chapter 7.

If you are going to use direct referencing for all your tags, you don't need to create HMI tags in FactoryTalk View.

Data Server tags usually update faster than HMI tags. To obtain the best system performance for your application, use Data Server tags where possible.

For information about creating Data Servers to data server tags, see Chapter 6.

Collecting information

Before you begin creating the tag database, collect:

- flowcharts of your processes (or process and instrument diagrams).
- a list of programmable controller data table or register addresses your application will have access to.
- machinery systems documentation.
- alarm requirements (for more information, see page 3-6).

Organizing tags

Before creating tags:

- Develop naming conventions for tags, choosing names that are familiar and logical to everyone. This makes troubleshooting easier.
- Group related tags.

Group tags in the way that makes the most sense for your application. For example, group all similar devices or group related areas of the plant floor.

When creating tags, place related tags into folders. For greater organization, nest folders.

Planning graphic displays

When planning displays, determine the best way for users to navigate through your displays and develop a template to establish a common look and feel for your displays.

Also consider factors about the run-time terminal that affect how the application is displayed and used, such as:

- screen size.
- the maximum number of displays supported at run time.
  - If the applications runs on a personal computer, the maximum number of displays is based on the type of activation used.
  - If the application runs on PanelView Plus, the maximum number of displays is based on the amount of memory used by the application. Applications run on a PanelView Plus can contain as many displays as can fit in the memory of the PanelView Plus terminal.
  - If the application runs on PanelView Plus Compact, for the maximum number of displays available when the application is running on a PanelView Plus Compact terminal, see page 4-5.
- whether the operator will be using a keyboard, touch screen, mouse, or combination of navigation and data entry methods.

For information about creating graphic displays, see Chapter 19.

Developing a hierarchy of displays

A hierarchy of displays is a series of graphic displays that provide progressively more detail as users move through them. Design your display hierarchy to meet the needs of the various users, including managers, supervisors, and operators.

Well-organized graphic displays present information clearly and consistently and guide users through the system. Before designing individual graphic displays, plan an overall display hierarchy and plan how users will navigate through the hierarchy.

For information about navigation methods and developing a hierarchy of displays, see Chapter 8.

Creating a template to ensure consistency

It is possible to keep a consistent appearance among all the displays in an application by presenting the same pieces of information in the same place on each graphic display. To ensure uniformity, develop a display with common elements that acts as a template. Each time you develop a new display, start with a duplicate of the template.

For example, the template could contain:

- your company logo.
- a title.
- the date and time.
- navigational buttons.

Use global object displays to create template objects. You can copy the objects into your graphic displays, and update all the objects at once by updating the original object in the global object display. For information about creating global object displays, see page 25-11.

Designing displays

When designing displays, applying good visual design principles helps users and increases their efficiency. Remember these important design principles:

Consistency

- Be consistent with your use of symbols and color.
- Be consistent with button labels and button placement.

  When you design several displays, place the same kinds of buttons in the same positions. For example, if you have a Start button in a certain position in one display, don't put a Stop button in the same position in the next display.

Clarity

- Use symbols that are easily recognizable. For example, use the conventional ISA symbols for tanks and valves.
- Don't overload the screen with information.
- Use standard, clear terminology, and avoid abbreviations or acronyms that the user might not understand.
- Use colors with recognizable meanings. For example, in North America the colors red and green usually mean stop and start. Keep color meanings consistent by assigning red only to Stop buttons, and green only to Start buttons.

Some people are color blind to red and green so don't rely on color alone to establish meaning.

- Use high contrast color combinations, such as yellow on blue.

Display Types

- On Top display type is used to position the display in front of any other display that is already open at run-time.
- Replace display type is used to have the display close any open displays on the screen at run-time. Replace displays do not close displays of the type On Top that have the Cannot Be Replaced option selected. Only one Replace display can be open at a time.

Usability

- If you're designing for a touch screen, don't place important buttons where they'll be blocked by an On Top display. The user can't press a covered button. Also, ensure the button is large enough for users to touch easily.
- Ensure there is always a clear way to move between displays.
- Keep the intended user in mind and design displays so they are easy to understand and use. Ask the users to test the displays.

Planning languages

Before setting up languages, plan:

- which languages you need to use.
- which Windows fonts support these languages.
  - For applications running on a personal computer which Windows fonts support these languages.
  - For applications running on a PanelView Plus terminal which languages the fonts resident on the terminal support.
- how different languages will affect design elements in your graphic displays, such as object size and message length.
- whether operators need to switch languages at run time, and if so, under what conditions. This will help you determine where to locate language switch buttons in your application.
- how to show operators which button to press to switch to their languages. For example, by using a text label in French, or a French flag, to alert a French operator.

For information about setting up language switching, see Chapter 12.

Planning alarms

Before setting up alarms, plan:

- what conditions will trigger alarms.
- how operators will be notified of alarms.
- what information you want alarm messages to contain.
- how operators will respond to alarms.
- the maximum number of alarm messages supported at run time. See page 4-5 for alarm restrictions on PanelView Plus Compact terminals as well as Windows, PanelView Plus and PanelViewPlus 6.

For information about setting up alarms, see Chapter 9.

Providing information for the operator

In addition to notifying the operator of alarm conditions, you can provide information and instructions about plant processes, and inform the operator about system activities.

Before setting up information notification, plan:

- what system activity the operator needs to be informed about.
- what conditions will trigger information messages.
- what information you want the messages to contain.

Local and information messages

Use local messages to give the operator information in a specific graphic display while the display is open. Use information messages to give the operator information no matter which display is open.

For information about setting up local messages, see page 19-26. For information about setting up information messages, see Chapter 27.

Diagnostics messages

Set up diagnostics messages to notify the operator of system activity such as tag reads and writes, running macros, communication problems, or problems opening displays.

For information about setting up diagnostics messages, see Chapter 10.

Planning trends

When planning trends, consider how they will be used. For example, will the trend be used to:

- analyze process trends?
- monitor production efficiency?
- archive process variables to ensure compliance with government regulations?

Based on such considerations, you can determine:

- which tags need to be plotted on the same trend.
- which tags need to be logged by using a data log model.

For information about setting up data logging, see Chapter 26. For information about creating trend graphic objects, see Chapter 28.

Planning recipes

When planning recipes, consider how they will be used. For example, will recipes be used to:

- compare tag values to pre-set data values?
- upload tag values to existing or new data sets?
- download values from data sets to tags?
- archive tag values to ensure compliance with government regulations?

Based on such considerations, you can determine:

- which tag sets and data sets to pair together in a recipe file.
- which RecipePlus button actions to use with the RecipePlus selector and RecipePlus table.

For information about using recipes and creating RecipePlus graphic objects, see Chapter 29.

Designing a secure system

When deciding on your security requirements, consider whether to:

- restrict access to every graphic display to prevent accidental changes.
- restrict access to certain graphic displays.
- have everyone log on.
- use passwords, and if so, whether to have a minimum length, and whether to require that the passwords are changed periodically.
- allow only authorized users to shut down the application.

- use the DeskLock tool on Windows platforms to prevent users from switching to another application at run time (for applications that will run on personal computers). You can use this tool to set up a customized desktop and to prevent access to Windows® functions.

Based on these considerations, you can set up security for individual users or groups of users. For example, you might want to set up groups of users such as a manager group and an operator group.

For more information about setting up security, see Chapter 11.

Working with applications

This chapter describes:

- application files.
- creating, importing, opening, and closing applications.
- renaming, copying, deleting, backing up, and restoring applications.
- specifying project settings.
- viewing application properties.
- viewing HMI server properties.

What is an application?

An application is the software application you create in FactoryTalk® View Studio to monitor and control your plant processes. An application consists of one or more data servers and an HMI project (also known as an HMI server). The data servers provide communications for the project. The project or HMI server consists of graphic displays, alarm information, user information, and other settings.

For information about viewing the application properties, see page 4-18. For information about viewing the HMI server properties, see page 4-18.

Application versus project

This manual generally uses the term application to refer to both application-level and project-level procedures. An exception is the section on using the Project Settings editor, which begins on page 4-11. In that section, the term project is used.

When you create an application, FactoryTalk View creates folders and files in various locations on the development computer. Some of the folders are empty until you start setting up your application. When you finish developing the application, FactoryTalk View uses the information in the various folders and files to create the run-time application.

HMI project file

The HMI project file has the extension .med. The HMI project file is located in this directory:

C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME\HMI projects (Windows XP or Windows Server 2003 R2)

or

C:\Users\Public\Public Documents\RSView Enterprise\ME\HMI projects (Windows 7 Professional, Windows Vistaor Windows Server 2008)

Run-time application file

The run-time application consists of a file with the extension .mer. For information about creating the run-time application, see Chapter 14.

Component files

Component files are located in folders in the HMI project folder, as described in the following table. For example, graphic display component files (with the extension .gfx) are stored in the Gfx folder. You might need to navigate to the location of these files, for example if you are adding a component from one application into another application.

This folder	Contains	File extensions
Application name	HMI project file and the folders described below	.med
DLG	Data log models (component files)	.mdf
Gfx	Graphic display component files	.gfx
Global Objects	Global object display component files	.ggfx
Images	Image files	.bmp or .jpg
Information	Information message component files	.ifm
Local	Local message component files	.loc
Macros	Macro component files	.mcr
PAR	Parameter component files	.par
RecipePlus	RecipePlus component files	.rpp

External folders

The following table lists some FactoryTalk View folders that are external to the HMI project folder, and the types of files they contain.

The folders are located in this directory:

C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise (Windows XP or Windows Server 2003 R2)

or

C:\Users\Public\PublicDocuments\RSView Enterprise\(Windows Vista,Windows 7 Professional or Windows Server 2008)

This folder	Contains	File extensions
Images	Image files for use on graphic objects	.bmp
ME\Archives	ME archive application files	.apa
ME\Libraries	Graphic library component files and image files used in the library displays	.gfx .bmp
ME\Logs*Runtime Application Name*\Dlglog*Data Log Model Name*	Data log files for applications that have run on the development computer	.log .tag
ME\Logs*Runtime Application Name*\M_Alarms	Alarm log file for applications that have run on the development computer	.alm
ME\Runtime	Run-time application files	.mer
ME\HMI projects	Sample application folders, including all files and folders needed for the sample	
ME\Faceplates	Graphic displays and global object displays for Logix5000 faceplates	.gfx .ggfx .bmp

If desired, you can specify a different directory in which to store graphic library component files. For more information, see page 19-19.

Default log file locations for PanelView Plus 6, PanelView Plus or PanelView Plus CE applications

On the PanelView™ Plus6, PanelView™ Plus or PanelView™ Plus CE terminal, alarm and data log folders are located by default in this directory:

Windows\Logs\

Data log file locations

You can also store data log files in a different location on the run-time computer, on a networked computer, or on a PC card. For more information, see Chapter 26.

Naming files

File names, including the path, can be up to 200 characters long (file names can contain spaces). For example, the following path and file name contains 119 characters:

C:\Documents and Settings\All Users\Documents\RSView Enterprise\ME\HMI projects\Malthouse Clgx 640x480\Gfx\Steeping.gfx

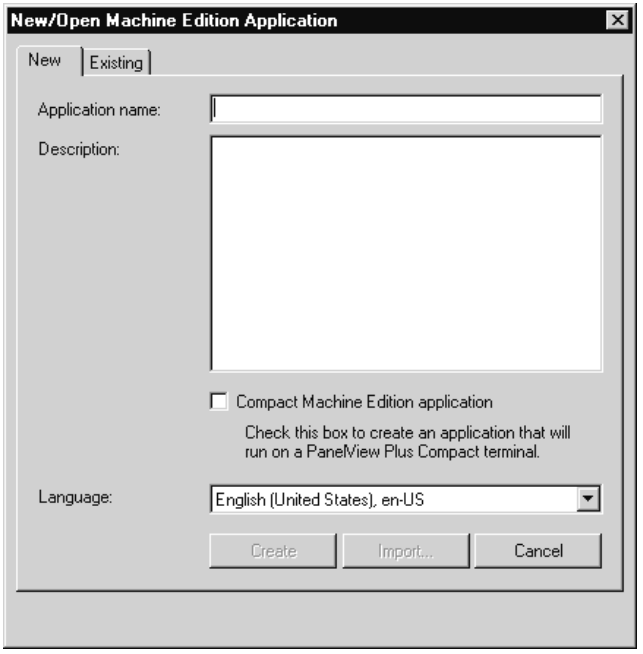
Creating, importing, opening, and closing applications

Creating applications

You can create a new application when you start FactoryTalk View Studio, or once FactoryTalk View Studio is already open.

To create a new application when you start FactoryTalk View Studio

1. Start FactoryTalk View Studio.



2. In the New tab, in the Application name box, type a name for your application, up to 32 characters long.
3. If desired, type a description of the application. If you don't type a description now, you can add one later, as described on page 4-18.

4. Specify whether the application will be a Compact Machine Edition application, that is, whether it is intended to run on a PanelView Plus Compact terminal. You can change this setting in the Project Settings editor later if necessary. For information about the Project Settings editor, see page 4-17.
5. Specify a language for the application. For information about using different languages, see Chapter 12.
6. Click Create.

   FactoryTalk View Studio creates the application's folders and files, and then displays the new application in the Explorer window.

The application is created in the ME\HMI projects directory, in a folder with the same name as the application name.

This is the path to the ME\HMI projects directory:

C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME\HMI projects (Windows XP or Windows Server 2003 R2)

or

C:\Users\Public\Public Documents\RSView Enterprise\ME\HMI projects (Windows Vista,Windows 7 Professional or Windows Server 2008)

Once you create the application the system auomatically creates a display called "MAIN" and sets the Projects Settings, startup Graphic to "Main".. These settings determine the general appearance of your run-time application, and affect how your graphic displays look. For more information, see page 4-17.

To create a new application when FactoryTalk View Studio is already open

New Application

1. On the File menu, click New Application, or click the New Application tool.

   If an application is already open, FactoryTalk View Studio asks you whether to close the application that is currently open. Click Yes.
2. Follow steps 2 through 5 in the previous procedure.

Importing applications

You can import PanelBuilder™, PanelBuilder32, PanelBuilder 1400e, and FactoryTalk View Machine Edition applications into FactoryTalk View Studio.

PanelBuilder and PanelBuilder32 files can be in either development format (*.pba) or run-time terminal format (*.pva). PanelBuilder 1400e files have the file extension *.pvc.

When you import older application files, FactoryTalk View creates a copy of the application for the current version of FactoryTalk View. The older version is not altered.

You can use current version application files to create previous version run-time files. For more information, see page 4-10.

If the application you are importing contains any direct driver nodes, the import wizard will create one RSLinx® topic for each direct driver node it finds. All topics are then converted into device shortcuts, to run with RSLinx® Enterprise™. You must have both RSLinx® Classic™ and RSLinx Enterprise installed to make this two-step conversion.

To create RSLinx topics after import, follow these steps in RSLinx before importing the application.

To validate direct driver nodes in RSLinx

1. Create the appropriate RSLinx Classic drivers if not already created (for example, AB_ETH-1).

   For more information about creating RSLinx Classic drivers, see the RSLinx Classic Help.

2. If it is an Ethernet® driver (AB_ETH-1), add the IP address of each direct driver node to the Ethernet driver setup.

3. Start RSWho and select each device associated with each direct driver node (for example, 131.200.13.128).

   If these steps are not followed in this order, the topics generated by the import code will be invalid and will need to be fixed using the Topic Editor in RSLinx.

To import an application

1. Start FactoryTalk View Studio

2. In the New tab, in the Application name box, type a name for the imported application, up to 32 characters long.

3. If desired, type a description of the application. If you don't type a description now, you can add one later, as described on page 4-18.

4. Specify whether the application will be a Compact Machine Edition application. Applications that exceed the Compact Machine Edition application limits will not be converted into Compact Machine Edition applications.

5. Specify a language for the application. For information about using multiple languages, see Chapter 12.

6. Click Import. The Machine Edition Import Wizard opens.

7. Follow the directions in the Machine Edition Import Wizard.

   For more information about importing PanelBuilder 1400e applications, see Appendix A. For more information about importing PanelBuilder and PanelBuilder32 applications, see Appendix B.

Opening applications

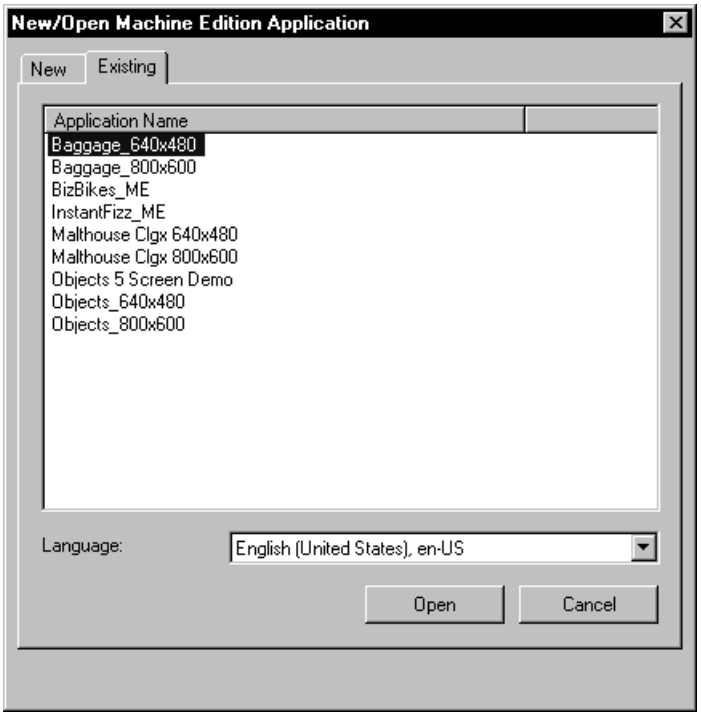
You can open an application when you start FactoryTalk View Studio, or once FactoryTalk View Studio is already open.

Older RSView Machine Edition application files are converted to the current version of FactoryTalk View when you open them. However, you can still use the current version of FactoryTalk View Studio to create older version run-time files. For information about the features supported in different versions of FactoryTalk View, see Appendix G.

For information about opening a sample application, see page 2-2.

To open an existing application when you start FactoryTalk View Studio

1. Start FactoryTalk View Studio.



2. Click the Existing tab, and then click the application to open.
3. Specify a language for the application, and then click Open. For information about using different languages, see Chapter 12.
4. If this is the first time you are opening an application that was created in RSView Machine Edition 4.00, you are prompted to select a default language. Select a language, and then click OK. For information about the default language, see page 12-2.

   FactoryTalk View Studio displays the application in the Explorer window.

To open an existing application when FactoryTalk View Studio is already open

Open Application

1. On the File menu, click Open Application, or click the Open Application tool.

   If an application is already open, FactoryTalk View Studio asks you whether to close the application that is currently open. Click Yes.
2. Follow steps 2 through 4 in the previous procedure.

To open an application you used recently

1. On the File menu, select Recent Applications, and then click the name of the application to open.
2. If an application is already open, FactoryTalk View Studio asks you whether to close the application that is currently open. Click Yes.

   The application opens. For applications with multiple languages, the language you used most recently opens. For information about using different languages, see Chapter 12.

Problems opening applications

If you have trouble opening an application in FactoryTalk View Studio, the problem could be a Microsoft® Windows security setting. You must have read and write access to the folder that contains the HMI projects. For example, if you belong to the Windows user group called Power Users, and the group does not have write access to the HMI projects folder, you won't be able to open applications in FactoryTalk View.

The default location for the HMI projects folder is:

C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME (Windows XP or Windows Server 2003 R2)

or

C:\Users\Public\Public Documents\RSView Enterprise\ME (Windows Vista,Windows 7 Professional or Windows Server 2008)

For more information about security, see Chapter 11.

To set up write access for any Windows Security Group

1. Right-click the HMI projects folder, and then click Properties.
2. In the Security tab of the Properties dialog box, select a Windows Security Group (ex. Power Users) from the list of groups and user names.
3. In the Permissions box below the list, select Full Control, and then select Allow.

Opening multiple applications

To open two applications at the same time, for example to copy images and graphic objects between applications, start two instances of FactoryTalk View Studio.

To view a graphic display in different languages at the same time, open the application multiple times, selecting a different language each time you open it.

Opening and editing applications from earlier versions of RSView

You can open and edit applications from RSView 3.10, 3.20, 4.00, 5.00, 6.00 and FactoryTalk View 6.10. When you are finished editing, you can create run-time application files for ME Station version 3.10, 3.20, 4.00,5.00, 5.10, 6.00 or 6.10. This allows you to continue running your applications on existing terminals, without upgrading all your software.

The application is converted to the current version of FactoryTalk View when you import it, but when you create the run-time application file you can save it back to the earlier version.

If the application uses a feature that is not supported by the run-time version, you will not be able to create the run-time application file. The exceptions are multiple languages, and global objects. When you create the run-time application file, it uses the application's current language. You can create as many different run-time application files, in as many different languages, as you want. However, the language switch feature is not available at run time for version 3.10, and 3.20 applications. Global objects are converted to regular objects in the run-time application file for versions 3.10, and 3.20.

For information about importing applications, see page 4-5. For information about the features supported in different versions of FactoryTalk View and RSView, see Appendix G. For information about using multiple languages, see Chapter 12. For information about using global objects, see Chapter 19.

Closing applications

To close an application

- On the File menu, click Close Application.

  If there are any unsaved changes in open editors, FactoryTalk View Studio asks you whether to save the changes before closing the application.

To close an application and exit FactoryTalk View Studio at the same time

Close button

- Click the Close button at the right end of the FactoryTalk View Studio title bar.

  If there are any unsaved changes in open editors, FactoryTalk View Studio asks you whether to save the changes before closing.

Renaming, copying, deleting, backing up, and restoring applications

Use the Application Manager tool to:

- rename applications.

- copy applications.
- delete applications.
- create a compressed backup copy of an application, with the file extension .apa.
- restore an application from the backup file, with the file extension .apa.
- restore a legacy project backup file (with the file extension .mea) from an earlier release of FactoryTalk View Studio, and convert it to the current version.
- restore a run-time application file, with the file extension .mer, to a development application, with the file extension .med. For more information, see page 14-7.

To start the Application Manager tool, do one of the following

- In FactoryTalk View Studio, on the Tools menu, click Application Manager.
- On the Windows Start menu, select Programs > Rockwell Software > FactoryTalk View > Tools > Application Manager.

For details about using the tool, see the Application Manager's Help.

About project settings

Project settings determine the general appearance of your run-time application, such as the size and position of the project window and whether a title bar appears in the project window. You can also change the setting for running Compact Machine Edition applications, and enable automatic logout of the current user.

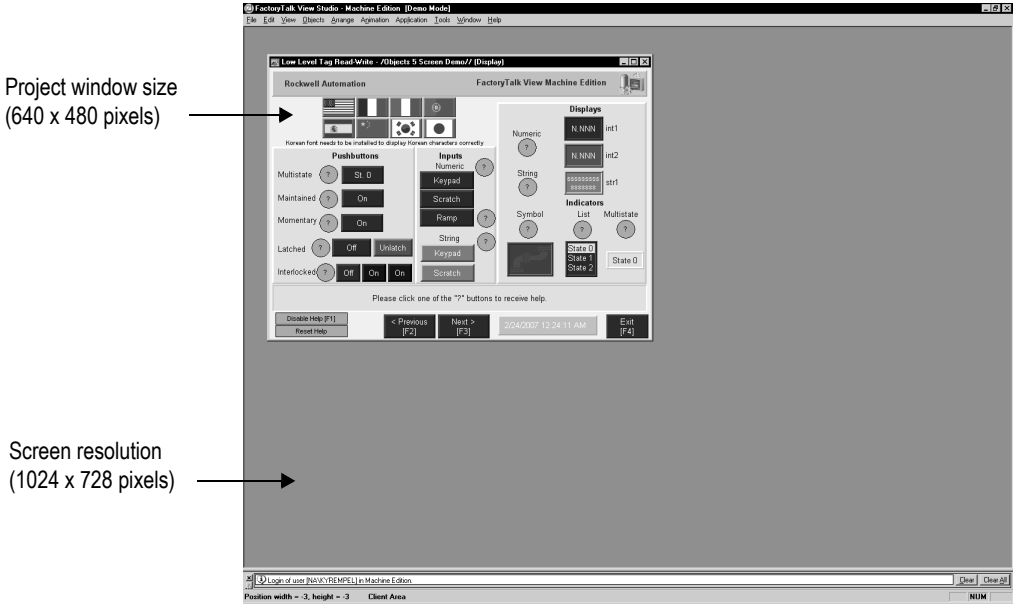
Since project settings affect how your graphic displays look, specify the settings before creating graphic displays.

Project window size and run-time screen resolution

This section describes the difference between project window size and run-time screen resolution, and describes how these two settings can affect the behavior of your application at run time.

The project window size is the amount of room your application occupies on the run-time terminal or computer screen, in pixels. The run-time screen resolution is the actual size of

the run-time terminal or computer screen, in pixels. Therefore, the project window size must be less than or equal to the run-time screen resolution.



Usually, an application is designed to completely fill the run-time terminal or computer screen. If you want your application to do this, set the project window size to the resolution of the screen in pixels. For information on setting the project window size, see page 4-17.

Screen resolution for PanelView Plus 6, PanelView Plus and PanelView Plus CE terminals

If you are going to run your application on a PanelView Plus 6, PanelView Plus or PanelView Plus CE terminal, select one of these project window sizes:

For this terminal or monitor	Select this project window size
PanelView Plus/PanelView Plus Compact - 400 or 600	320x240
PanelView Plus - 700 or 1000 PanelView Plus CE - 700H or 1000H PanelView Plus 6 -700 or 1000 PanelView Plus Compact - 1000	640x480

For this terminal or monitor	Select this project window size
PanelView Plus - 1250 PanelView Plus CE - 1250H PanelView Plus CE - 1200P, 1200M, or 1200W PanelView Plus 6 - 1250	800x600
PanelView Plus - 1500 PanelView Plus CE - 1500H PanelView Plus CE - 1500P, 1500M, or 1500W PanelView Plus 6 - 1500	1024x768
PanelView Plus CE - 1700M	1280x1024
PanelView Plus CE - 2000M	1600x1200 (Custom size)

If you are creating an application for a PanelView Plus 400 or 600 terminal:

- Resize the default message displays so that the entire message is visible.
- Reposition the [ALARM] display from the default position (0, 0), as this position is below the viewing area of the terminals.

Changing the project window size after creating graphic displays

The project window size is used for all graphic displays of the Replace type. If you change the window size after you have already created graphic displays, you have the option of scaling graphic displays.

If you choose to scale graphic displays, all Replace and On Top displays are resized and the objects in them are scaled to fit the new size. You can also specify whether to scale the font size and border size of the graphic objects, and the size of graphic images in the Images folder.

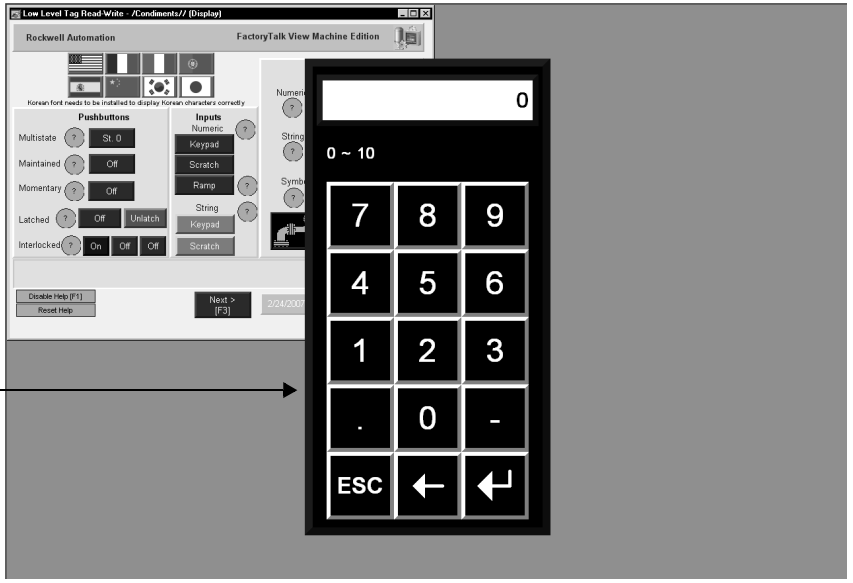
If you choose not to scale displays when you change the project window size, Replace displays are resized, but any objects in the displays remain the same size and in the same position as before. On Top displays are not resized.

For more information about Replace and On Top displays, see page 19-12. For more information about scaling displays, see Help.

How the run-time screen resolution affects the pop-up windows

FactoryTalk View comes with a pop-up Login window, as well as numeric and string pop-up windows for run-time data entry, and a Change Password window for changing user passwords at run time.

FactoryTalk View sizes the pop-up window to occupy the center of the screen.



How the project window size affects the default message displays

Your application comes with preconfigured, default graphic displays for diagnostics, alarm, and information messages. If the project window size is smaller than the default displays, the edges of the displays are cut off at run time.

These are the sizes of the default displays:

Graphic Display	Width in pixels	Height in pixels
[DIAGNOSTICS]	640	160
[ALARM]	640	210
[INFORMATION]	640	80

If your project window size is smaller than the default message display sizes, you can resize the default displays, or use your own displays instead.

Compact Machine Edition application

Applcations intended for PanelView Plus Compact terminals have certain restrictions, such as the number of displays and alarm messages supported.

Whether an application will be developed as a Compact Machine Edition application is specified when the application is first created. You can change that choice here at any time.

Title bar

If you select this option, a title bar is used for all Replace graphic displays. For information about graphic display types, see page 19-12.

If desired, you can also use a Control box, Minimize button, and Close button on the title bar. The Close button appears only if you select the Control box in the Project Settings editor.

If you plan to set up security for your application and want to prevent unauthorized users from stopping the application, do not use a title bar.

For information about setting up security, see Chapter 11.

Changing the Title bar or Border setting

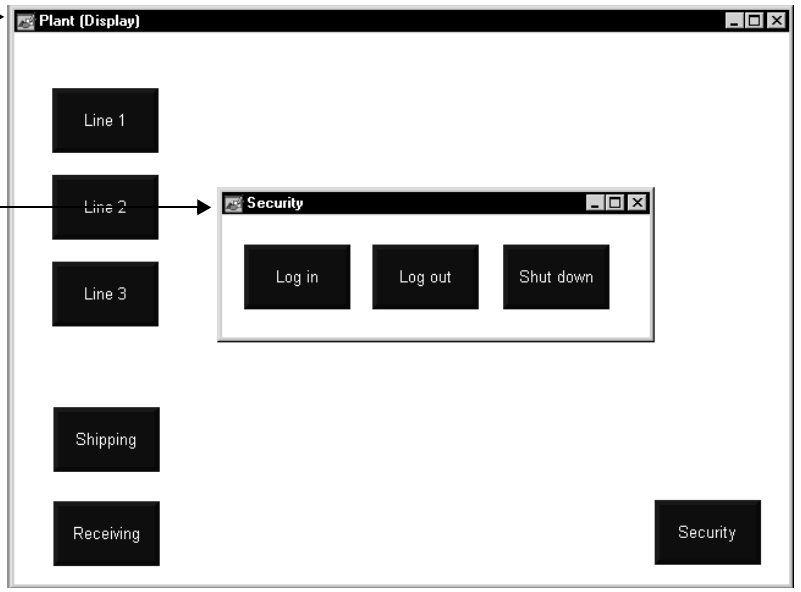
If you change the Title bar or Border setting, you have the option of scaling graphic displays to accommodate the new display size. For details, see Help.

Title bar for On Top displays

For On Top displays, you can specify a different name to use in the title bar. Use the Display Settings dialog box to specify the name (for details, see Help).

The title you specify in the Project Settings editor applies to all replace displays.

You can specify a different title for each On Top display (using the Display Settings dialog box in the Graphics editor).



Enable auto logout

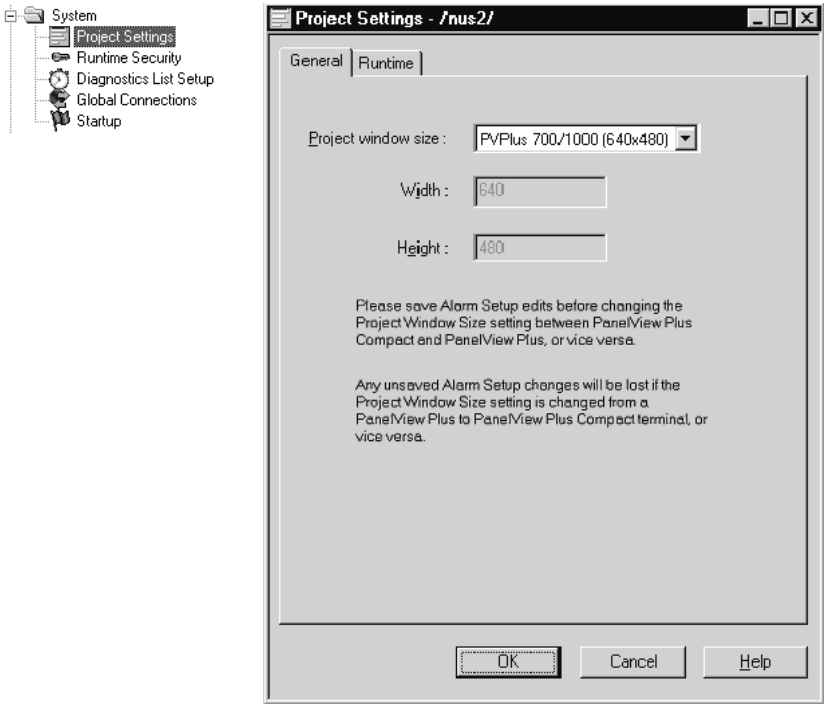
Use the Project Settings Runtime tab to log the current user out automatically if the terminal is inactive for a specified period of time. You can set up the terminal to open a particular graphic display after the automatic logout, and you can apply a parameter file or parameter list to the display you select.

If no display is selected, whatever display was open at logout will remain open.

Note that this auto-logout feature that returns to a specific display applies to ALL user accounts including the DEFAULT user account.

Specifying project settings

To specify project settings, use the Project Settings editor. For details about selecting options in the editor, see Help.


System
Project Settings
Runtime Security
Diagnostics List Setup
Global Connections
Startup
Project Settings - /nus2/
General
Runtime
Project window size :
PVPlus 700/1000 (640x480)
Width :
640
Height :
480
Please save Alarm Setup edits before changing the Project Window Size setting between PanelView Plus Compact and PanelView Plus, or vice versa.
Any unsaved Alarm Setup changes will be lost if the Project Window Size setting is changed from a PanelView Plus to PanelView Plus Compact terminal, or vice versa.
OK
Cancel
Help

You can change an application to PanelViewPlus Compact by selecting it in the Project window size list.

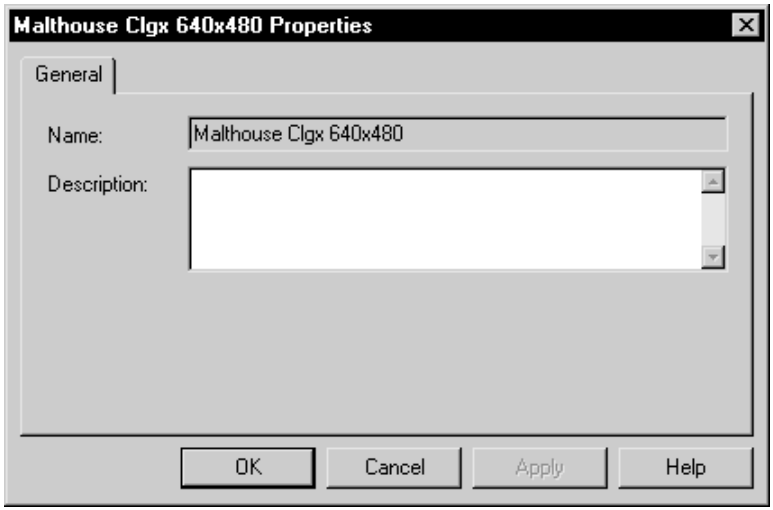
Viewing application properties

You can view this information about your application:

- application name
- application description, if any

To view application properties

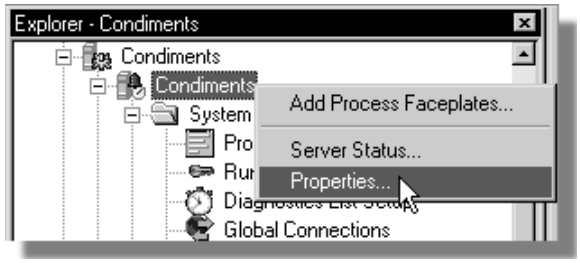
- On the Application menu, click Application Properties.



Viewing HMI server properties

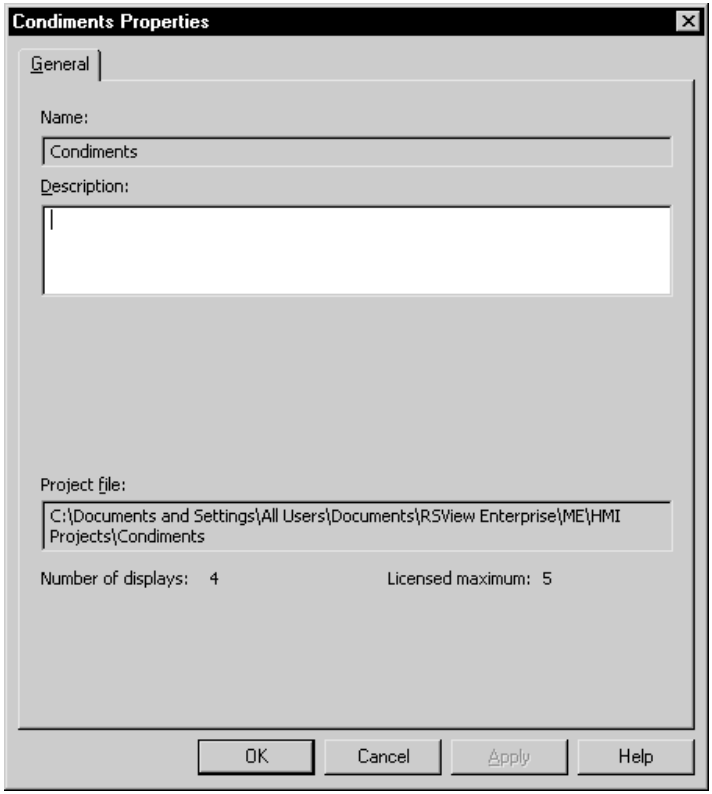
You can use the Explorer window to view this information about your project or HMI server:

- application name
- application description, if any
- location of the project file
- number of graphic displays in the application
- maximum number of displays you're licensed to use



To view HMI server properties

- In the Explorer window, right-click the HMI server name, and then click Properties.



5 Setting up communications

This chapter describes:

- OPC® communications.
- what data servers are.
- creating data servers in your application.
- updating data server caches.

About OPC communications

OPC® is OLE for Process Control, used to connect FactoryTalk® View to communication devices via vendor-specific OPC servers. FactoryTalk View supports the OPC Data Access (DA) 2.05 specification.

OPC servers provide a way for FactoryTalk View to retrieve tag values from:

- Allen-Bradley® controller devices, using RSLinx® Classic™ or RSLinx® Enterprise™ as an OPC server.
- third-party controller devices, such as Siemens or Modicon®, using third-party OPC servers such as KEPServerEnterprise™.

ControlNet Scheduled, DeviceNet I/O and Remote I/O are not supported on PanelView™ Plus 6.0 PanelViewPlusNG terminal and Windows CE terminals. They are not supported on personal computers.

Summary of steps

To set up communications, follow these steps:

1. Gather information about your network, and the devices that are connected to it. You will need this information to set up RSLinx Enterprise, RSLinx Classic, or another OPC server.
2. If you want to use RSLinx Enterprise for communications, install it on the development computer.

   For information about installing RSLinx Enterprise, see the *FactoryTalk View Machine Edition Installation Guide*.
3. If you want to use RSLinx Classic as the OPC server that enables communications on your network, set up RSLinx Classic on the development computer. RSLinx Classic is included on the FactoryTalk View Machine Edition DVD-ROM. For details, see *Getting Results with RSLinx*, or see Help for RSLinx.

RSLinx Classic is available for personal computers only.

4. If you want to use an OPC server other than RSLinx Classic for communications on your network, set up the OPC server on the development computer. For details, see the documentation supplied with your OPC server.
5. In FactoryTalk View Studio, create a data server that points to the OPC server you set up in step 3 or step 4.

   For details, see page 5-3.

   If you are using RSLinx Enterprise for communications, you don't need to create a data server because it is created automatically when you create your FactoryTalk Machine Edition application.
6. If you want to use HMI tags in your application, open the Tags editor, and then create device tags that point to addresses in devices. For details about creating HMI tags, see Chapter 7.

   If you do not want to use HMI tags, but instead want to reference addresses in devices directly, skip this step.

Best practice is to use direct reference tags.

7. In objects in graphic displays, or anywhere else you want access to values in tags, type the tag name using the syntax for your OPC server, or use the Tag Browser to select tags. For details about using tags, see Chapter 6.
8. Create the run-time application file. For details, see Chapter 14.

   All the necessary tag information is compiled with the run-time application file.
9. If you are using an OPC server other than RSLinx Enterprise or RSLinx Classic, install the OPC server software on the run-time computer.

   For applications that will run on a personal computer, the OPC server can be on a different (remote) computer than the run-time computer, but the remote computer must be on the same network as the run-time computer.

About data servers

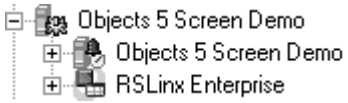
A data server provides a route to the physical devices on your network, so you can see the values in those devices, for example:

- programmable controller values.
- OPC tags, and their value or status information.

- named variables in a Logix5000 processor.

Creating data servers

An RSLinx Enterprise data server is created automatically with a new application. It is located under the application's HMI server in the Explorer window, just above the FactoryTalk System folder.



You can create additional OPC data servers for your application. For example, you might want to use an RSLinx Enterprise data server and a KEPServerEnterprise data server.

If you use RSLinx Enterprise, you cannot use Logix5000 with an Ethernet connection to connect to other Allen-Bradley devices or bridge to DH+ or Remote I/O networks. If you need to do this, use RSLinx Classic.

Setting up RSLinx Enterprise data servers

Use an RSLinx Enterprise data server when you want to use RSLinx Enterprise communications.

You can use the Communication Setup editor to add drivers, add devices, set up driver and device properties, and set up device shortcuts.

To set up communications in RSLinx Enterprise

1. In the Explorer window, open the RSLinx Enterprise data server.

2. Double-click the Communication Setup editor.
3. In a new application, the RSLinx Enterprise Configuration Wizard opens. Follow the instructions to create a new configuration or use an existing device configuration. Once you make a choice and click Finish, the Communication Setup editor opens.

   In an existing application, double-clicking Communication Setup opens the Communication Setup editor, with its two tabs. The Design (Local) tab is for establishing the location of the tags/addresses for editing. The tags/addresses can be online with a controller or other data server, or an offline controller file. This will enable the Tag Browser to find the tags/addresses.

The Runtime (Target) tab is for identifying the connection from the run-time computer or terminal to the controller or other data server. If the paths are the same, use the Copy button to copy the Design configuration to the Runtime tab.

For more information, see Help for RSLinx Enterprise.

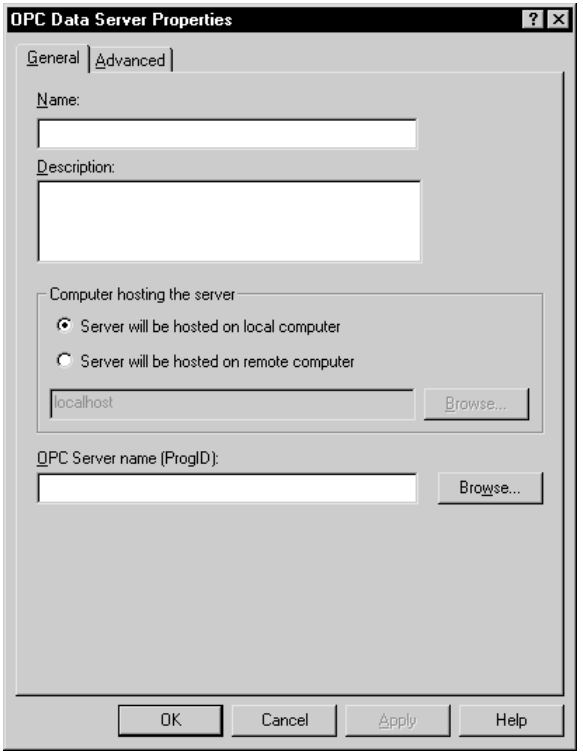
Setting up an OPC data server

Use an OPC data server if you want to use RSLinx Classic instead of RSLinx Enterprise, or if you want to use a third party OPC data server.

You can set up a cache for tags on the data server. A cache allows you to view tag names when you are not connected to the data server.

To create an OPC data server

- In the Explorer window, right-click the application, select Add New Server, and then click OPC Data Server.



For details about selecting options in the OPC Data Server Properties dialog box, see FactoyTalk View Machine Edition Help.

For information about editing and removing data servers, see FactoryTalk View Machine Edition Help.

Updating data server caches

If tags are added, modified, or deleted on the data server, you must update (synchronize) the cache manually.

For information about updating the data server cache periodically after you create it, see FactoryTalk View Machine Edition Help.

6 Working with tags

This chapter provides general information about working with all kinds of tags. This chapter describes:

- types of tags.
- when to use data server tags.
- steps for using data server tags.
- when to use HMI tags.
- steps for using HMI tags.
- browsing for tags and offline tags.
- using the Tag Browser.
- using tags and expressions in your application.
- logging tag values.
- using macros to assign values to tags.

For information about creating HMI tags, see Chapter 7.

Types of tags

A tag is a logical name for a variable in a device or in local memory (RAM). For example, a tag can represent a process variable in a programmable controller.

Data server tags

FactoryTalk® View conforms to the OPC® Data Access (DA) 2.05a specification for information exchange among automation or control applications, field systems or devices, and business or office applications.

In FactoryTalk View, data servers such as RSLinx® Enterprise™, RSLinx® Classic™, and KEPServerEnterprise™ provide access to OPC-DA-compliant tags. In the FactoryTalk View documentation, the tags you use through a data server are called data server tags. For more information about data servers, see Chapter 5.

Data server tags include tags found in Logix5000 processors and tags from other OPC-compliant devices. You use data server tags by providing a direct reference to the tag's location, wherever you want your application to use the data.

HMI tags

In addition to direct referencing tags from data servers, FactoryTalk View allows you to create tags with additional properties such as minimum and maximum values, scale, and offset. These tags can reference values at an external data source, or store values in the run-time computer's memory. Tags you create in FactoryTalk View are called HMI tags.

The data source

The FactoryTalk View documentation uses the term data source as a generic term that includes all possible sources of tag data, for both data server tags and HMI tags. The data source can be memory or a device such as a programmable controller or an OPC server. FactoryTalk View writes values to and reads values from the data source. The data source is set up to exchange information (in the form of numeric or string values) between the FactoryTalk View value table and the machine that your application is controlling.

Basic steps for using tags

To use tags, follow these basic steps:

1. If the tag does not already exist, create the tag.

   To use a data server tag, you can use an existing tag in the processor (for example, a programmable controller), or you can create a new one in the processor or OPC server. For example, in a Logix5000 processor, you could create the tag using your RSLogix™ 5000 programming software.

   To use an HMI tag, you must first create it in the Tags editor. For details, see Chapter 7.

2. Browse for, or type, the name of the tag anywhere you want to connect an object to data at run time.

   For example, to make a push button change a tag value when it is pressed, connect the push button to a tag by typing the tag name in the Connections tab of the push button's Properties dialog box.

Browsing for tags

If you don't know the names of tags, you can browse for them. You can browse while online and connected to a device, or you can browse for tags from an offline file, for example a Logix5000 program file.

To browse for tags, use the Tag Browser. For details, see page 6-5.

Using tag names that don't exist

You can type the name of a tag that doesn't yet exist. If you do this, ensure that you spell every instance of the tag name consistently, and that when you do create the tag, you spell it the same way you did when you referred to it.

When to use data server tags

For some of the things you want to do in your application, you might not need to create HMI tags. Use direct references to tags located in devices instead, for example, tags located in an OPC server's database.

Eliminating duplication

Using data server tags allows you to add, modify, or delete tags in a device without having to duplicate the changes in the FactoryTalk View HMI tag database.

Using complex data

Some devices, for example Logix5000 processors, support complex data types such as arrays and structures. Your controller might have structures that contain hundreds of member elements.

Referencing tag values directly eliminates the need for creating an HMI tag for each member.

Direct reference tags usually update faster than HMI tags. To obtain the best system performance for your application, use direct reference tags where possible.

Steps for using data server tags

To use data server tags, complete three basic steps:

1. Create the tag in the OPC server or processor, or use an existing tag in the processor.

   The server must understand the syntax of the device it is connected to. You need only create a tag if you want to browse the server.

   Examples of OPC servers include RSLinx Enterprise, RSLinx Classic, and KEPServerEnterprise. For information about creating tags in OPC servers that have their own tag database, see the documentation provided with the server.

   For information about creating tags in a Logix5000 processor, see the documentation for your device programming software.

2. Create a data server in FactoryTalk View, if your application doesn't already have one. Every new FactoryTalk View Machine application includes a RSLinx Enterprise data server automatically.

For more information, see Chapter 5.

3. In graphic displays, data log models, or anywhere else you want to use a tag's value, create a direct reference to the tag. At run time, the tag's value is passed to the graphic display or data log model.

When to use HMI tags

Use HMI tags to manipulate tag data and to store tag values in the run-time computer's memory.

Scaling, offsetting, or providing a range for data

Use HMI tags if the data server you are using does not provide for:

- scaling or offsetting a value.
- setting minimum or maximum limits on a value (that is, providing a range of values).

Scale and offset

The scale and offset modify the "raw data" that comes from and goes to the programmable controller before the data is saved in the computer's memory (called the value table). The scale and offset also modify the value specified in FactoryTalk View before it is written to the programmable controller.

The scale is a multiplication factor—the value from the programmable controller is multiplied by the scale.

The offset is a fixed value—after the value from the programmable controller is multiplied by the scale, the offset amount is added.

Minimum and maximum

HMI tags allow you to set a minimum and maximum value that can be written to the programmable controller or server.

These values do not affect what is read from the programmable controller or server.

For example, if you specify a minimum of 0 and a maximum of 100, FactoryTalk View would be able to read a value of 200 from a programmable controller and store it in the value table, but would not be able to write this value to the programmable controller.

For more information about minimum and maximum, and scale and offset, see Help.

Storing values in FactoryTalk View memory

A memory tag can be used to store values without the need for an attached or accessible device.

For example, you might need to store a value in memory:

- to store the result of a calculation.
- temporarily, for example, a counter or index.
- to maintain information about the system's current state, for example which graphic display was last displayed.

For information about creating HMI memory tags, see Chapter 7.

Steps for using HMI tags

To use HMI tags, complete two basic steps:

1. In the Tags editor in FactoryTalk View, create a tag. HMI tags can be used as an internal storage location. Optionally you can map the tag name to an OPC tag or device address.

   For more information, see Chapter 7.

2. In graphic displays, alarm triggers, or anywhere else you want to use a tag's value, assign the tag. At run time, the tag's value is passed to the graphic display or alarm system.

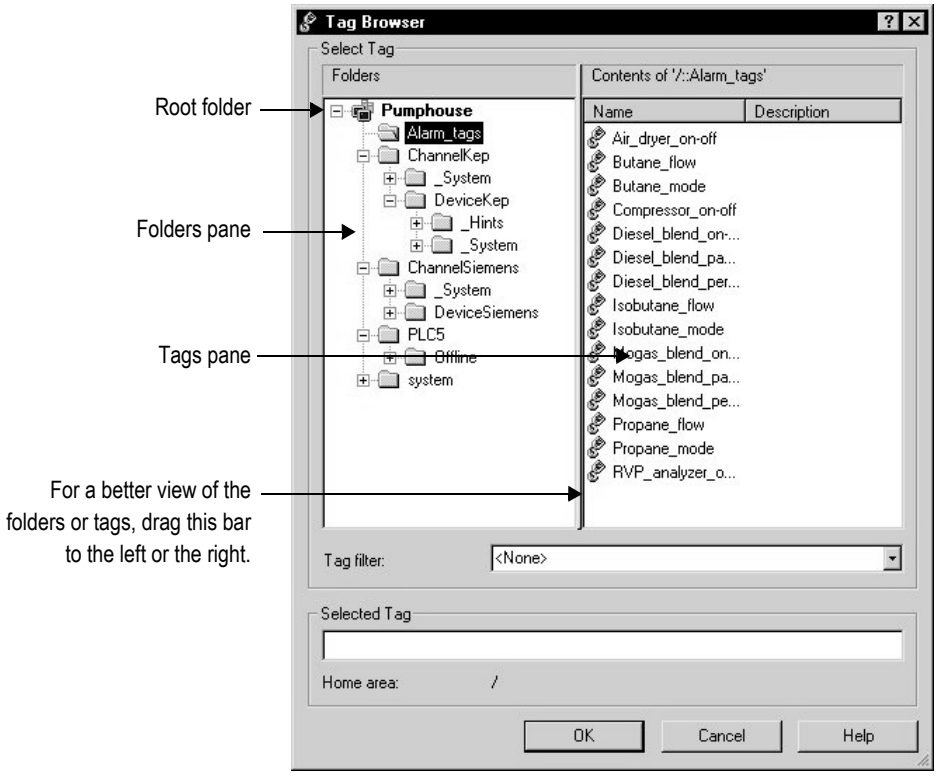
Browsing for tags

You don't have to remember the path and name of a tag to use it in your application. Whenever you need to use a tag, you can open the Tag Browser and select the tag to use.

To open the Tag Browser

- In most editors, click the Browse button in the Tags column.
- In the Expression editor, position the cursor where you want to insert a tag name, and then click Tags.
- In the Parameters editor, double-click where you want to insert a tag name.

Using the Tag Browser



In the Tag Browser, you can:

- select a single tag or multiple tags. The ability to select multiple tags is available in the Data Log Models editor only. In the illustration above, only a single tag can be selected.
- select data server tags and HMI tags.
- select a folder of tags without selecting a specific tag in the folder. This is useful for applications that use process faceplates. It is also useful when you use global object parameters. Folders of tags are also known as backing tags or structured tags. For information about global object parameters and process faceplates, see Chapter 25.

  You cannot select backing tags when you open the Tag Browser from the Data Log Models editor.
- create and edit HMI tags.

- create new folders for HMI tags.
- import tags from a PLC or SLC™ database.

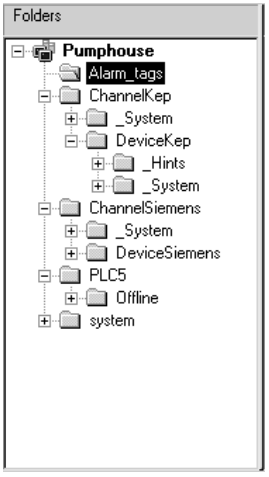
For more information about using the Tag Browser, see Help.

Showing server names

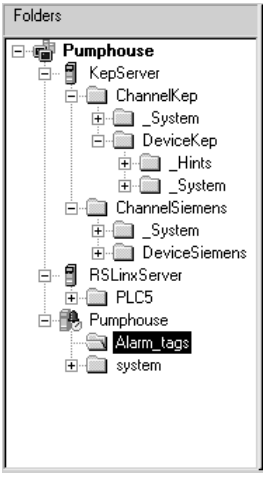
By default, the Folders pane in the Tag Browser shows folders, but not the servers they belong to. You can show the names of servers that have been set up in the application.

To display server names

- Right-click a blank area of the Folders pane and then click Show Server Names.



The folders list with server names hidden.



The folders list with server names shown.

In the example on the left, folders are listed alphabetically by name.

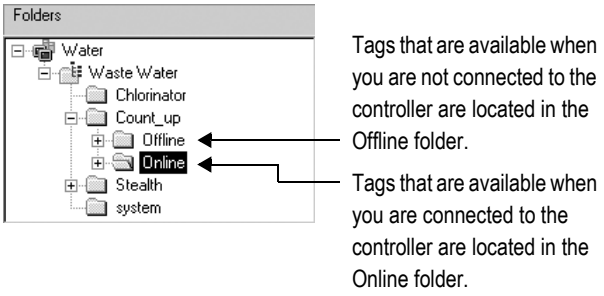
In the example on the right, there are two data servers, named KepServer and RSLinxServer. Folders of data server tags are listed under the data server to which they belong. Below the data servers, the application is listed as an HMI server, with folders of HMI tags under the application name.

Browsing for off-line tags

For each RSLinx Enterprise device shortcut, or each RSLinx Classic OPC topic in your application, an Offline and an Online folder is displayed in the Tag Browser.

In RSLinx Enterprise, you can use the Offline folder to browse tags in an RSLogix 5000 RSLogix.acd file. For details about making the .acd file available to browse offline, see RSLinx Enterprise Help.

In RSLinx Classic, you can use the Offline folder to browse tags in a PLC program stored on disk. If the OPC topic in RSLinx Classic has access to symbols, you can browse for them in the Offline folder. For details about adding symbols to the OPC topic in RSLinx Classic, see RSLinx Classic Help.


Folders
Water
Waste Water
Chlorinator
Count_up
Offline
Online
Stealth
system
Tags that are available when you are not connected to the controller are located in the Offline folder.
Tags that are available when you are connected to the controller are located in the Online folder.

Using tags and expressions in your application

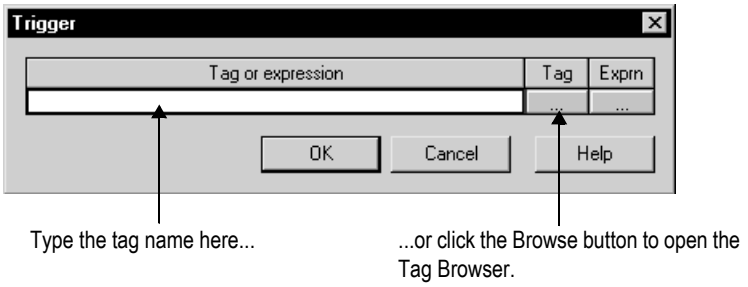
Once you've created tags (either in data servers or in FactoryTalk View), assign them to connections in your application to allow the application to interact with the data source and perform actions based on the tag values.

You can assign tags in these editors:

- Expressions
- Global Connections
- Graphic Displays
- Global Object Displays
- Graphic Libraries
- Parameters
- Alarm Setup
- Information Setup
- Macros
- Data Log Models
- RecipePlus Editor

Assigning tags

This example shows the Trigger dialog box that opens when you click the Add button in the Triggers tab of the Alarm Setup editor:



To assign a tag, do one of the following

- In the Tag or expression column, type the tag name.
- In the Tag column, click the Browse button and then select a tag from the Tag Browser.

For information about using the Tag Browser, see Help.

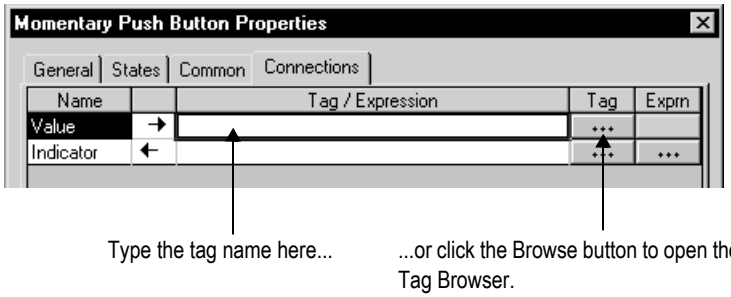
Assigning tags to graphic objects

In the Graphics editor, you can assign tags to many of the graphic objects you create.

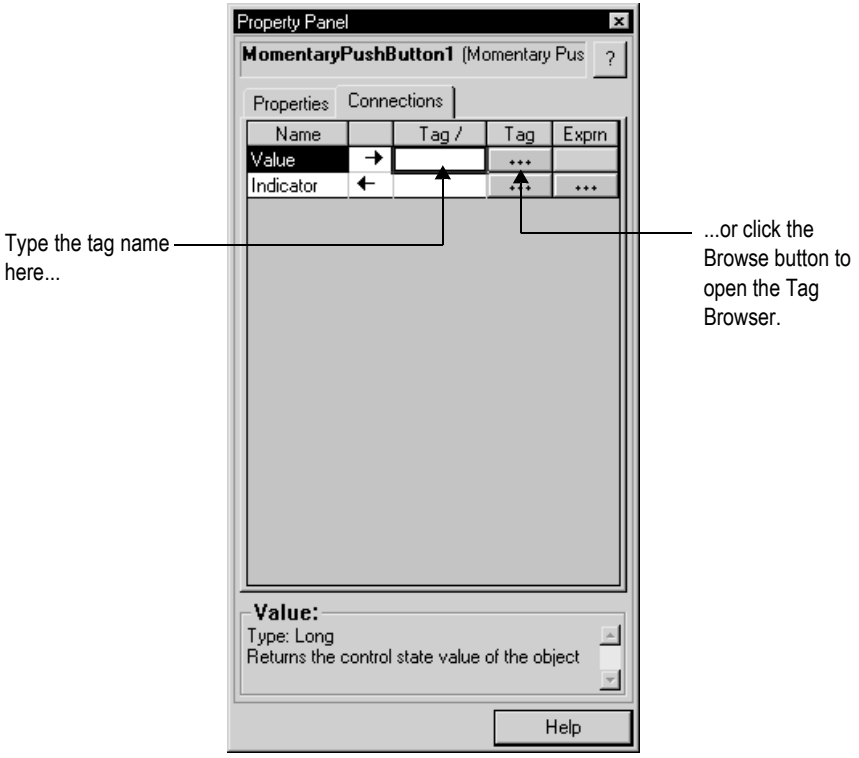
You can use up to 1,000 tags per graphic display. This limit includes the tags contained in embedded variables and expressions. For example, if an expression references the same tag twice, this counts as two tag references.

Use one of these methods to assign tags to a graphic object:

- Double-click the object to open the object's Properties dialog box, and then click the Connections tab.



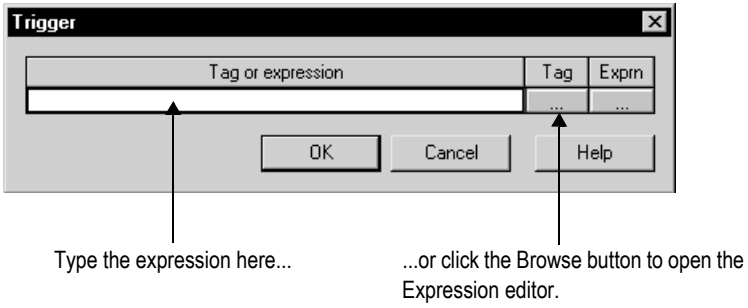
- Select the object, and then assign tags in the Connections tab of the Property Panel.



Using expressions to manipulate tag values

In many of the places where you can assign a tag, you can also use expressions to perform logical or mathematical calculations on tag values. If you assign an expression, FactoryTalk View monitors the expression value rather than the original tag value. For example, your machine might send values to the data source in the form of temperature in degrees Celsius. You could use an expression to convert the value to degrees Fahrenheit, and then monitor the expression result rather than the original tag value.

If you can assign an expression, a Browse button is present in the Exprn column in the editor or Connections tab.



To assign an expression, do one of the following

- In the Exprn column, click the Browse button, and then create an expression in the Expression editor. Use this method if you want to check the expression syntax.
- In the Tag or expression column, type the expression. The expression syntax is not checked if you use this method.

For more information about expressions, see Chapter 23.

Substituting tag names used in graphic objects

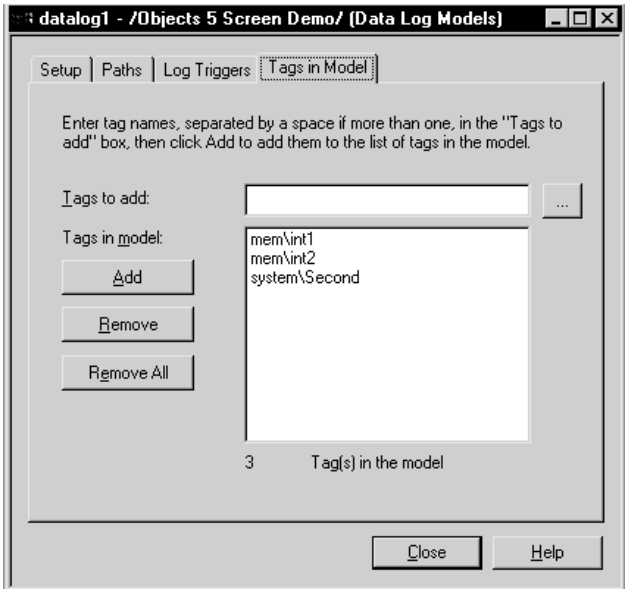
You can use tag substitution to replace tag names and expressions assigned to the connections for graphic objects. For example, if you assign a tag to multiple objects in a graphic display, and then decide to use a different name for the tag, you can create a new tag and then use tag substitution to search for all tag references with the old name, and replace them with the new tag name.

You can also use tag substitution to replace the tags contained in embedded variables.

For more information about tag substitution, see page 20-36.

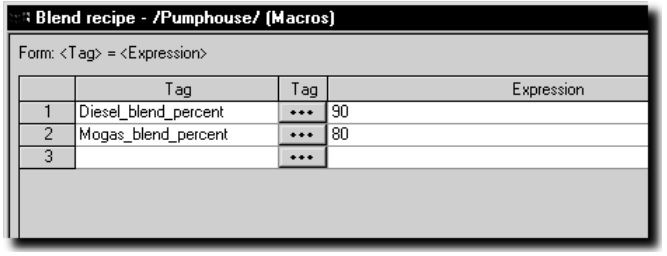
Logging tag values

Analog and digital tag values can be logged, including both HMI and data server tags. To set up data logging, use the Data Log Models editor. For more information, see Chapter 26.



Using macros to assign values to tags

A macro is a list of tag assignments stored in a text file. Whenever you run the macro, the specified values are written to the tags. For more information about macros, see Chapter 30.



You can also use recipes to assign values to multiple tags with a button press. For information about using recipes to assign values to tags, see Chapter 29.

7 Using HMI tags

This chapter describes:

- HMI tag types.
- using the Tags editor.
- data sources.
- addressing syntax for device tags.
- organizing HMI tags.
- viewing tag statistics.
- other methods for creating HMI tags.
- importing HMI tags.

HMI tag types

HMI tags are tags you create in FactoryTalk® View. For information about when to use HMI tags versus when to use data server tags, see Chapter 6.

You can create and use these types of HMI tags in FactoryTalk View:

This tag type	Stores this type of data
Analog	Range of values. Use analog tags to represent variable states such as temperature or the position of rotary controls.
Digital	0 or 1. Use digital tags to represent devices that can only be on or off, such as switches, contacts, and relays.
String	ASCII string, series of characters, or whole words (maximum of 82 characters). Use string tags to represent devices that use text, such as a bar code scanner that uses an alphanumeric product code.

This tag type	Stores this type of data
System	Information generated while the system is running, such as the name of the logged-in user, system time and date, and so on. FactoryTalk View creates system tags when you create an application. The system tags are stored in the folder called "system" in the HMI tag database. You cannot edit system tags. You can use system tags anywhere you would use any other type of tag. For a list of system tags, see Appendix C.

Analog tags that use floating-point values

You can assign analog tags to most of the connections in FactoryTalk View, including both HMI and data server tags. If the analog tag uses a floating-point data type but an integer value is required, the floating-point value is rounded.

For information about the data types available for analog tags, see Help.

How values are rounded

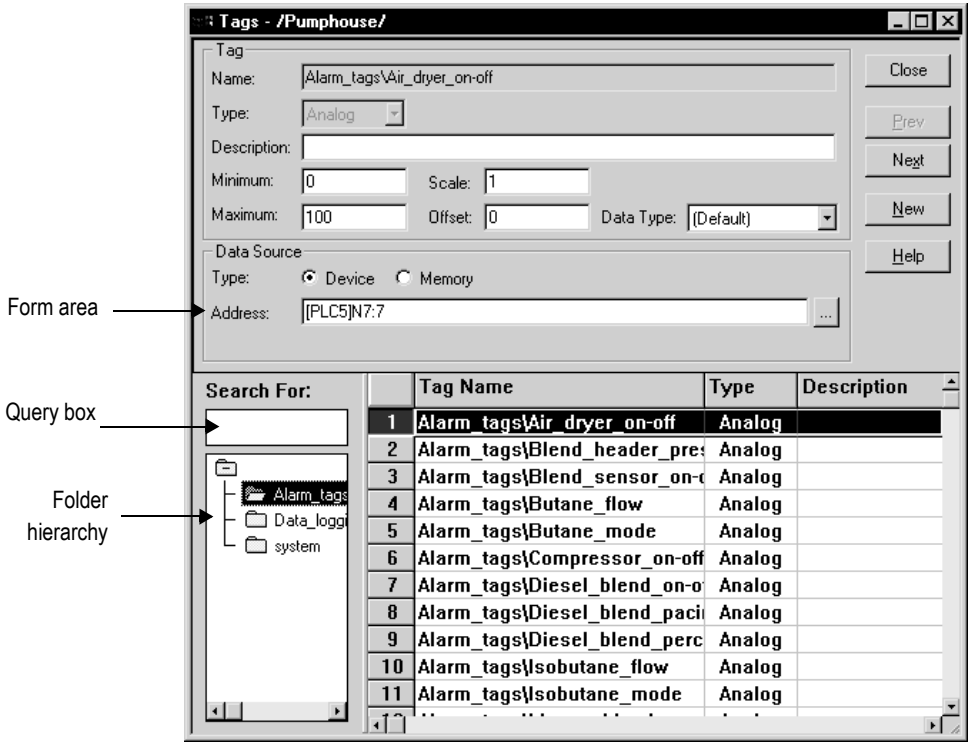
When a floating-point value must be rounded to an integer, this is how the value is rounded:

- If the number after the decimal is 4 or less, the value is rounded down. For example, 8.495 is rounded to 8.
- If the number after the decimal is 6 or more, the value is rounded up. For example, 8.6 is rounded to 9.
- If the number after the decimal is 5, the value is rounded using a "banker's algorithm," to average out the rounding over time:
  - If the number before the decimal is 0, the value is rounded down. For example, 10.5 is rounded to 10.
  - If the number before the decimal is an odd number, the value is rounded up. For example, 11.5 is rounded to 12.
  - If the number before the decimal is an even number, the value is rounded down. For example, 12.5 is rounded to 12.
  - Floating point values are rounded to a maximum of six digits. Therefore, using a floating-point data type and adding to it a value that exceeds the six significant digits will result in a rounding error. For example, adding any number to 999,999 will result in a rounding error.

This rounding method is also used for numeric input enable buttons that use the implicit decimal position, if an integer tag is assigned to the button's Value connection. For more information about the numeric input enable button, see page 21-30.

Using the Tags editor

The Tags editor has these parts: form area, query box, folder hierarchy, and spreadsheet area.



The information you enter in the form area is displayed in the spreadsheet area. The folder hierarchy displays all the folders that you and FactoryTalk View create.

The Tags editor has special items on the View menu to control the appearance of the editor, and extra tools on the toolbar.

Use the Tags editor to:

- create folders
- duplicate, nest, and delete folders

- create and view tags
- edit, duplicate, and delete tags

For details about using the Tags editor, see Help.

Updating the contents of the Tags editor

You can create tags in the Tags editor, but you can also create them as you work in other editors, and you can import them from an existing tag database. To see the result of changes to the database you make in other editors while the Tags editor is open, update the contents.

To update the contents of the editor

Refresh tool

- On the View menu, click Refresh, or click the Refresh tool.

When you click Refresh, the undo buffer is cleared and recent changes can't be automatically reversed.

Refresh is not available if you haven't accepted the current tag.

For information about creating tags in other editors, see page 7-8.

Searching for HMI tags

Use the Tags editor's query box to select the tags you want to display in the spreadsheet. This allows you to edit tags in different folders without browsing the folder hierarchy. You can:

- select a single tag by typing the tag name.
- select multiple tags by typing wildcard characters.

These are the wildcard characters:

This character	Does this
?	Matches any single character.
*	Matches any number of characters, including the backslash (\) character. Use this wildcard character by itself to display all the tags in the HMI tag database.

For example, to search for all the tags that contain the string "pump" in their name, type *pump* in the Search For box. When you press Enter, a list of tags containing the string "pump" appears in the spreadsheet.

When you do searches, remember that the backslash in a folder name counts as a character in the tag name.

Data sources

When creating an HMI tag, you must specify a data source. The data source determines whether the tag receives its values externally or internally.

The data source

The FactoryTalk View documentation uses the term data source as a generic term that includes all possible sources of tag data, for both data server tags and HMI tags. The data source can be memory or a device such as a programmable controller or an OPC® server. FactoryTalk View writes values to and reads values from the data source. The data source is set up to exchange information (in the form of numeric or string values) between the FactoryTalk View value table and the machine that your application is controlling.

Device

A tag with device as its data source receives its data from a source external to FactoryTalk View. The data can come from a programmable controller or other device via RSLinx® Enterprise™, or from another OPC server. You can use up to 5,000 device tags.

For analog tags with Device as the data source, the data type determines the format used when reading and writing tag data to the data server.

Memory

A tag with memory as its data source receives its data from (and stores values in) the FactoryTalk View internal value table. Tags with memory as the data source do not count toward the total tag limit.

For analog tags with Memory as the data source, select the data type that matches the format of the data you will store in the tag. Choosing Default is the same as choosing Floating Point.

Addressing syntax for device tags

For device tags, you must provide the address and path to the OPC server that is connected to the data source. For example, the OPC server could be connected to a device such as a programmable controller.

The syntax for OPC tag addresses is:

[AccessPath]Address

or

::[AccessPath]Address

where :: indicates that the address resides in a data server in the application. (The two colons are necessary when the address contains a colon, for example, N7:0.)

The square brackets are part of the syntax. They do not indicate optional parameters.

The access path is one of the following:

- For communications with an RSLinx Enterprise data server, the access path is the name of the device shortcut in RSLinx Enterprise.
- For communications with an RSLinx® Classic™ OPC server, the access path is the name of an OPC topic in RSLinx Classic.
- For communications with other OPC servers, the access path might be optional. For information about the syntax for the access path, see your OPC server documentation.

Example: Logix5000 addressing

We recommend that you use the Tag Browser to select OPC items. When you use the Tag Browser the correct syntax and data types are selected automatically.

However, if you want to define tags before setting up communications, you can type the address manually, as shown in this example. If you type the address manually, be sure to select the data type for the tag that matches the data type used by the Logix5000 processor. If you use the Default data type, values are treated as floating-point values.

This example shows you how to specify the OPC topic, item name, and bit level of an item that uses the integer data type in a Logix5000 processor.

OPC topic and item addressing

Logix5000 uses this addressing syntax:

[*Device shortcut*]*item name* for RSLinx Enterprise.

[*OPC topic name*]*item name* for RSLinx Classic.

In this example, the RSLinx Enterprise device shortcut name for the Logix5000 processor is CLGX. To connect to an OPC item called Motor, type this address:

[CLGX]Motor

Bit level addressing

You can gain access to the bit level of an item that uses the integer data type by appending .# to the end of the tag address, where # is the number of the bit you want access to.

For example, to gain access to the first bit of the integer item Motor, type this address:

[CLGX]Motor.0

Organizing HMI tags

Organizing tags makes finding and using tags faster and simpler. To organize your tags, try these tips:

- Establish naming conventions.

  Naming conventions enable you to use wildcard characters most effectively when searching for and displaying tags during development.

- Use folders to group related tags.

Naming tags

Tag names can be up to 255 characters long including folder name. If you create a folder, the folder name becomes part of the tag name. The backslash (\) after a folder name counts as a character.

The tag name can contain these characters:

- A to Z
- 0 to 9
- underscore (_) and dash (-)

Tag names cannot contain spaces. The tag name can be mixed case. Tag names preserve upper and lower case for readability but are not case sensitive. For example, the tag name MixerValve1 is the same as mixervalve1.

When a tag name starts with a number or contains a dash, enclose the name in curly brackets { } when you use it in an expression, for example, {N33-0}. For more information about using tags in expressions, see Chapter 23.

Using folders to group tags

To organize tags, create a folder to store tags that are related to one another. To separate the folder name from the rest of the tag name, use a backslash (\). For example, tags in the folder called Pump would start with Pump\.

For greater organization, you can nest folders. For example, you can organize the HMI tag database first by area, then by machines in the area, and finally by devices in each machine. The result might be Area1\Machine1\Pump.

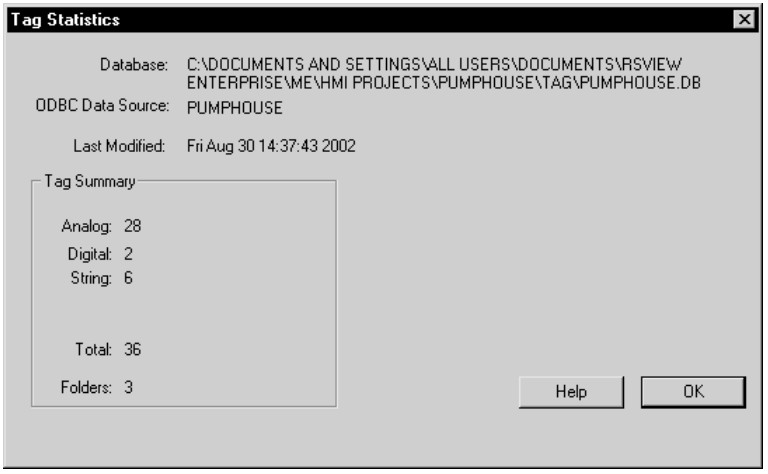
To create similar groups of tags quickly, create one folder with its tags and then duplicate the folder.

Viewing tag statistics

The Tag Statistics dialog box provides a summary of how many tags your application uses, as well as other tag information such as the date the HMI tag database was last modified. To view tag statistics, the Tags editor must be open and have focus.

To view tag statistics

- On the View menu, click Tag Statistics.



Other methods for creating HMI tags

In addition to creating tags in the Tags editor, you can:

- create tags as needed in other editors (using the Tag Browser).
- import tags from a PLC or SLC™ database. For details see page 7-9.

Creating tags as needed in other FactoryTalk View editors

You can create tags as needed in any editor or dialog box that uses tags. You can add a tag to the database by doing one of the following:

Browse button in the Tag column

- Click the Browse button in the Tag column to open the Tag Browser and create the tag. For information about using the Tag Browser, see page 6-5.
- Type a new tag name in the "Tag or expression" column. Keep track of the tag name, and add the tag in the Tags editor when convenient.

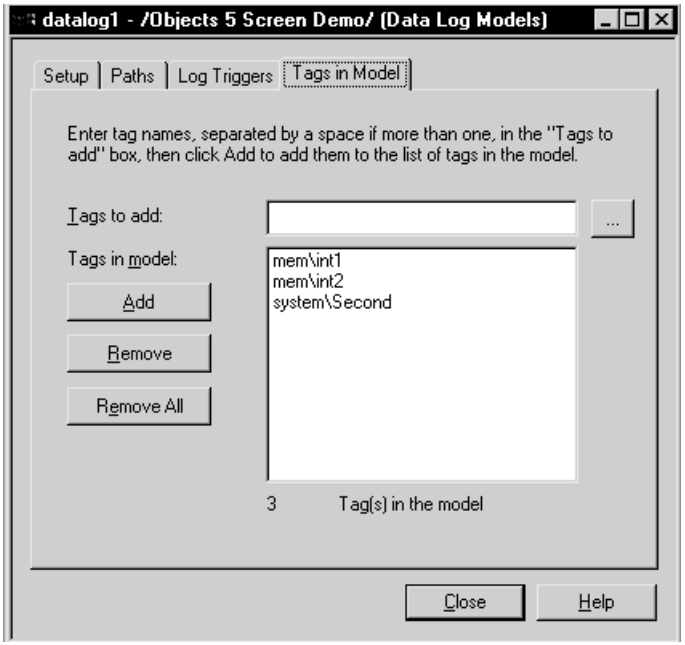
Creating tags as needed in the Data Log Models editor

In the Data Log Models editor, in the Tags in Model tab, you can add a tag to the database by doing one of the following:

Browse button in the Data Log Models editor

- Click the Browse button beside the “Tags to add” box to open the Tag Browser and create the tag. For information about using the Tag Browser, see page 6-5.
- Type a new tag name in the “Tags to add” box, and then click Add. You are warned that the tag does not exist. Click Yes to add the tag to the list of tags in the datalog model. Keep track of the tag name, and add the tag in the Tags editor when convenient.

For more information about the Data Log Models editor, see Chapter 26.



Importing tags from a PLC database

Use the Import PLC Tags dialog box to selectively import tags from a PLC or other database into your application’s HMI tag database. Tags imported in this way are copied into the database—they are not shared with the source database. This means changes to tags in your application do not affect the database from which they have been imported, and vice versa.

You can import tags from any of these databases:

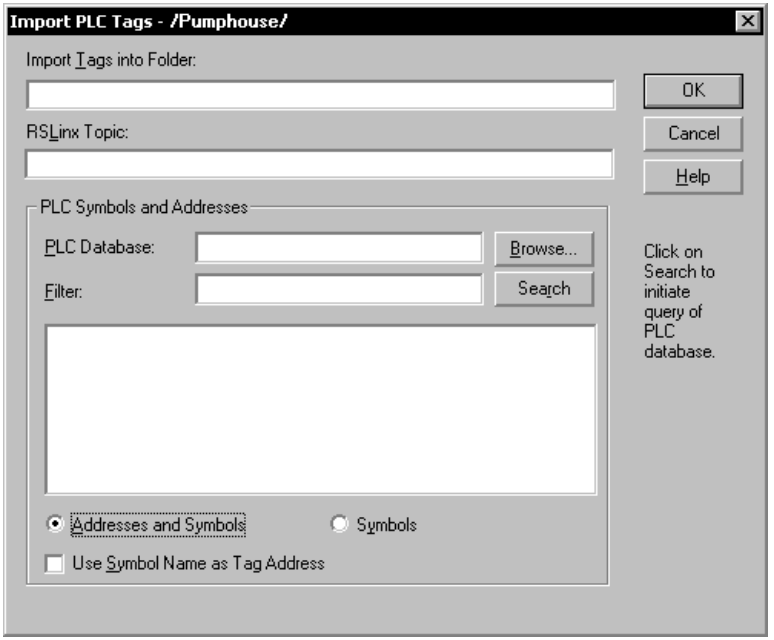
- RSLogix 500 internal database, with file extension .rss
- RSLogix 5 internal database, with file extension .rsp
- RSLogix™ 5 or RSLogix 500, saved as an external database, with file extension .ctd (before importing, explicitly export to the .ctd format to be sure of including the latest changes)
- legacy PLC databases, created using WINtelligent™ LOGIC 5 or A.I.™ 5, with file extension .dsc

For PLC and SLC addresses, the Import PLC Tags dialog box shows only addresses that are used in the symbol or address list of the PLC programming software.

DB Browser tool in the Tags editor

To open the Import PLC Tags dialog box, do one of the following

- In the Tag Browser, right-click the right pane, and then click Import PLC Tags. For information about using the Tag Browser, see page 6-5.
- In the Tags editor, on the Edit menu click Other Databases, or click the DB Browser tool.



For more information about using the Import PLC Tags dialog box, see Help.

Using the Tag Import and Export Wizard

You can also import PLC or SLC databases into FactoryTalk View using the Tag Import and Export Wizard.

You can use the wizard to:

- export your application's tags to a .csv file.
- import tags from another FactoryTalk View application's tag .csv file.
- merge tags from another FactoryTalk View application (that is, import them directly from the application, without first creating a tag .csv file).
- import tags from legacy PLC databases, created using WINtelligent LOGIC 5 or A.I. 5, with file extension .dsc.
- import tags from RSLogix 5 or RSLogix 500, saved as an external database, with file extension .ctd (before importing, explicitly export to the .ctd format to be sure of including the latest changes).

To start the wizard, do one of the following

- In FactoryTalk View Studio, on the Tools menu, click Tag Import and Export Wizard.
- On the Windows® Start menu, select Programs, Rockwell Software, FactoryTalk View, Tools, and then click Tag Import and Export Wizard.

For details about using the wizard, see the wizard's Help.

8 Setting up global connections

This chapter describes:

- what global connections are.
- updating the date and time.
- changing displays.
- controlling display changes remotely.
- using parameter files or parameter lists with display changes.
- close On Top displays.
- printing displays.
- running macros.
- setting up the backlight intensity remotely.
- monitoring run-time RAM usage.

About global connections

Global connections are connections that apply to your entire run-time application. Global connections allow the data source to control or interact with your application at run time.

You can use global connections to:

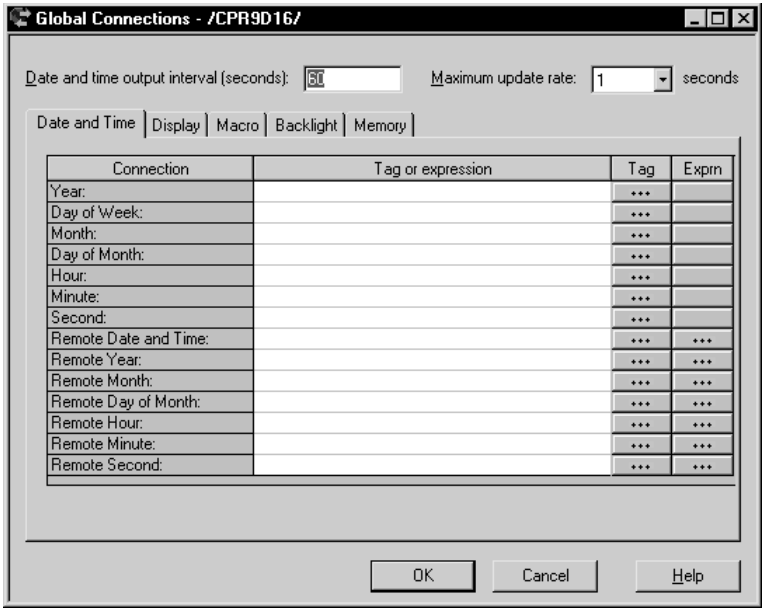
- update the date and time at the data source using the run-time terminal's date and time.
- update the date and time on the run-time terminal using the data source date and time.
- notify the data source of the current display number.
- notify the data source when a display is printed.
- change the display on the run-time terminal remotely (from the data source).
- close On Top displays
- apply parameter files or parameter lists to the tag placeholders in the changed displays.
- print the current display from the data source.
- run up to five macros from the data source, when a tag or expression result changes.
- set the intensity of the backlight on a PanelView Plus 6,PanelView Plus or PanelView Plus CE terminal.

- monitor run-time RAM usage for troubleshooting purposes.

The use of each global connection is optional.

Setting up global connections

Use the Global Connections editor to set up global connections.



For detailed information about the options in the Global Connections editor, see Help.

Updating the date and time

Use the date and time connections in the Date and Time tab of the Global Connections editor to update the date and time. You can assign any or all of the date and time connections, or leave them unassigned.

Normally you would assign only one set of date and time connections, either to update the date and time at the data source from the terminal, or to update the terminal's internal clock from the data source.

The values of assigned date and time connections are updated in the order in which the connections are listed in the Global Connections editor.

Updating the date and time at the data source from the terminal

To update the date or time at the data source from the terminal's internal clock, assign a tag to one or more of these connections:

This connection	Contains this range of values
Year	00-99
Day of Week	1-7, with 1 being Sunday
Month	1-12
Day of Month	1-31
Hour	0-23
Minute	0-59
Second	0-59

Specify how frequently to update the values of the assigned connections at the data source (from the terminal's internal clock) by typing a time in the "Date and time output interval" box.

Updating the date and time at the terminal from the data source

This option is especially useful if you have several terminals connected to the same data source. Instead of the operator resetting the date and time manually on each terminal, the data source can reset all internal clocks at once.

To update the date or time in the terminal's internal clock from the data source, assign a tag or an expression to the Remote Date and Time connection. Also assign a tag or an expression to one or more of these connections:

This connection	Contains this range of values
Remote Year	00-99 or 0000-9999
Remote Month	1-12
Remote Day of Month	1-31
Remote Hour	0-23
Remote Minute	0-59
Remote Second	0-59

When the Remote Date and Time connection value changes to a new non-zero value, the terminal resets its internal time and date to the time and date read from the individual remote date and time connections.

The date and time are updated at the rate specified in the "Maximum update rate" box, but changes are not made until the Remote Date and Time connection changes to a new non-zero value.

Changing displays

Use these global connections in the Display tab of the Global Connections editor to monitor and control display changes:

- Replace Display Number—notifies the data source of the number of the Replace display that's currently open.
- Remote Display Number—allows the data source to change the display on the run-time computer.

Controlling display changes remotely

To control display changes remotely, you can set up the data source to open and close graphic displays.

The data source can open Replace and On Top displays, and close On Top displays, remotely. To use remote display changes, assign a unique display number to each Replace and On Top display that you want to change remotely.

To open a Replace display,or an OnTop display remotely, assign a tag or expression to the Remote Display Number connection. When the data source sends a display's number to the connection, the specified display opens. When the connection's value is 0, the operator has control of display changes (using display navigation objects).

To close one or all On Top displays, assign a tag or expression to the Close an On Top Display or the Close All On Top Displays connection, or both. When the source sends a non-zero value to one of these connections, one or all open On Top displays will close. The operator can control On Top display changes no matter what the connection values for the Close an On Top Display or the Close All On Top Displays connections are.

Note: On Top displays whose Cannot Be Replaced setting is true cannot be closed using these connections.

For information about assigning numbers to displays, see Help.

Remote display changes and security

If you set up the data source to open graphic displays remotely, remote display changes occur whether or not the logged-in user has security access to a given display.

Setting up remote display changes

This section outlines the steps for setting up remote display changes. For more detailed information about the Global Connections editor, see Help.

To set up remote display changes

1. In the Graphics editor, in the Display Settings dialog box, every new display is assigned the number 1 by default. Therefore, to use remote display changes, you must assign a unique display number to each Replace and On Top display that you want to change remotely.

   For more information about graphic displays, see Chapter 19.

2. In the Global Connections editor, assign a tag or an expression to the Remote Display Number connection.

3. If you assign a tag to the Remote Display Number connection, set up the data source to send a display's number to the connection when you want the display to open.

   If you assign an expression to the Remote Display Number connection, FactoryTalk® View monitors the values of the tags used in the expression, and uses the expression result to determine which display to open.

4. If you assign a tag to the Close An On Top Display or Close all On TopDisplays connection, or both, set up the data source to send a display's number to the connection when you want one or more displays to close.

   If you assign an expression to the Close An On Top Display or Close all On TopDisplays connections, FactoryTalk® View monitors the values of the tags used in the expression, and uses the expression result to determine which display to close.

Printing displays

Use these global connections in the Display tab of the Global Connections editor to monitor and control display printing:

- Display Print Active—notifies the data source that a display print is in progress.
- Remote Display Print—allows the data source to trigger a display print.

The operator can also print the current display by pressing the display print button. For information about setting up this button, see Help.

When the data source or the operator prints a display, everything on the screen is printed, including the current display, pop-up windows, and any visible background applications.

If you plan to print graphic displays remotely, turn off the screen saver. If the screen saver is on when a remote display print is triggered, only the screen saver image is printed.

For information abut turning off the screen saver on personal computers, see your Windows® documentation.

For information about turning off the screen saver on a PanelView™ Plus 6,PanelView Plus or PanelView Plus CE terminal, see the *PanelView Plus Terminals User Manual*.

Closing On Top displays

Use these global connections to close displays remotely:

- Close an On Top display—notifies the data source of the number of the On Top display to be closed.
- Close All On Top Displays—notifies the application to close all On Top displays whose display number is not zero.

Only replaceable On Top displays can be closed remotely.

Applying parameters to changed displays

Use these global connections to replace tag placeholders in displays that use parameters when they open:

- Parameter file—identifies the parameter file for the display being opened remotely.
- Use Parameter List—notifies the application that a parameter list is to be used to provide the parameters to the display being opened remotely.
- Parameter Tag #1-10— the tag values assigned to these global connections will replace the tag placeholders in the display being opened remotely.

Running macros

Use these global connections in the Macro tab of the Global Connections editor to run macros:

This connection	Runs this macro
Remote Macro1	Macro1
Remote Macro2	Macro2
Remote Macro3	Macro3
Remote Macro4	Macro4

This connection	Runs this macro
Remote Macro5	Macro5

Create the macros in the Macros editor. Make sure you name them exactly as shown in the right column of the preceding table (with no space in the name).

When the tag or expression assigned to one of these connections changes to a new non-zero value, FactoryTalk View runs the associated macro.

Leave time for a macro to run before starting a new macro. Otherwise, FactoryTalk View will queue the macros, which consumes memory and could lead to system instability. When you shut down FactoryTalk View ME Station, if a message about executing macros is displayed for more than a few seconds this means that macros have been queued.

For information about creating macros, see Chapter 30.

Setting up backlight intensity remotely

For applications that will run on PanelView Plus 6 terminals, use the Remote Backlight Intensity connection in the Backlight tab of the Global Connections editor to set the backlight intensity of a run-time terminal remotely from a data source.

To update the backlight intensity of the run-time terminal from the data source, assign a tag or an expression to this read-only connection.

This connection	Contains this range of values
Remote Backlight Intensity	0-100

At run time, the application reads the value at the data source and sets the backlight to the percentage of its maximum intensity corresponding to the value. For instance, if the value of the connection is 25, the backlight will be set to 25% of its maximum intensity. This value will override the terminal's own backlight intensity setting.

If the value of the connection is greater than 100, the backlight will be set to its maximum intensity. If the value is less than 0, the backlight is set to its minimum intensity. That is, it will be turned off.

Monitoring run-time RAM usage

Sometimes it is helpful to monitor run-time RAM usage for troubleshooting purposes. If your application seems to be running slowly, consuming too much memory, or interfering with the operation of other applications on the same personal computer or terminal, it is useful to monitor the exact amount of memory the applications are consuming.

The PanelView Plus and PanelView Plus CE terminals' operating systems have a 32 MB RAM process limit. On these terminals, FactoryTalk View ME Station has a tag connection threshold of 26 MB. Screen change performance will slow down significantly as the system adds and removes tag connections from the cache.

PanelView Plus 6 terminals' operating systems have a 2 GB RAM process limit, this creates easier memory management.

The run-time RAM memory usage can be monitored by using the run-time RAM usage global connections.

To reduce run-time RAM usage, reduce the number of displays or tags in your application, and restart the application regularly (for example, once a week). Adding more RAM to the terminal will not help.

For more information, see Answer ID 39481 in the Rockwell Automation Knowledgebase.

Use these global connections in the Memory tab of the Global Connections editor to monitor run-time RAM usage:

This connection	Provides this information, in kilobytes (Kb)
MERuntime RAM Usage	The amount of memory being used by your application (and by the MERuntime.exe process)
Total RAM Usage	The total amount of memory being used by all applications (and processes) on the personal computer or terminal
Available RAM	The remaining amount of memory available
Remote RAM Usage	Assign a tag or expression to this connection. When it has a non-zero value, data is sent to the other three connections, if assigned.

You can monitor the values of the MERuntime RAM Usage, Total RAM Usage, and Available RAM connections using data logging or using graphic objects such as numeric displays. The connections are updated every 10 seconds as long as the Remote RAM Usage connection has a non-zero value. Set up the data source to set this connection to a non-zero value when you want memory monitoring to occur, or assign the same tag or expression to a graphic object such as a maintained push button that the operator can use to turn memory monitoring on and off.

These connections are available when you run FactoryTalk® View ME Station on a personal computer and on the PanelView Plus 6,PanelView Plus and PanelView Plus CE terminals.

For PanelView Plus 6,PanelView Plus and PanelView Plus CE terminals, you can also turn on the display of RAM usage statistics at run time. To do this, in the Configuration

Mode window select Runtime RAM Usage, and then make your selections in the Runtime RAM Usage window. For more information, see the *PanelView Plus Terminals User Manual*.

9 Setting up alarms

This chapter describes:

- steps for setting up alarms.
- preparing to set up alarms.
- how alarms work.
- alarm trigger data types.
- tips for using array tags.
- optional alarm connections.
- creating alarm messages in multiple languages.
- the [ALARM], [ALARM BANNER], [ALARM MULTI-LINE], [STATUS], and [HISTORY] displays.
- using displays from the library in your application.
- creating your own alarm display.
- opening and closing the alarm display.
- how the alarm list, alarm banner, and alarm status list graphic objects work.
- using buttons to acknowledge, silence, clear, and delete alarms.
- using buttons to sort alarms and reset alarm status.

About alarms

An alarm occurs when something goes wrong or is about to go wrong. Alarms can signal that a device or process has ceased operating within acceptable, predefined limits, and can indicate breakdown, wear, or process malfunctions. Alarms are also used to indicate the approach of a dangerous condition.

Alarms are an important part of most plant control applications because an operator must know the instant something goes wrong. It is often equally important to have a record of the alarm and whether the alarm was acknowledged.

Compact applications (applications running on PanelView Plus Compact terminals) have a limited number of alarm messages.

Multiple language alarm messages

A key component of any alarm system is the messages that appear when alarms occur. FactoryTalk® View supports alarm messages in multiple languages. For information about setting up alarm messages in multiple languages, see page 9-17.

Other multiple language alarm features

FactoryTalk View supports using multiple languages for all captions on alarm objects. In addition, these alarm features can be translated into multiple languages:

- title of the alarm history report
- title of the alarm status report

Alarm objects and reports use the time formats for the current application language. For more information about using multiple languages, see Chapter 12.

Summary of steps

Follow these steps to set up alarms:

1. In the Alarm Setup editor, set up alarm triggers (the tags or expressions to monitor), define the alarm messages and their trigger values, and specify the graphic display to open when alarms occur (if any).

   Also use this editor to specify trigger types, "Acknowledge all" values, the maximum alarm log file size, the hold time, and optional connections.

2. In the Startup editor, ensure that the Alarms box is checked (it is checked by default). See Help.

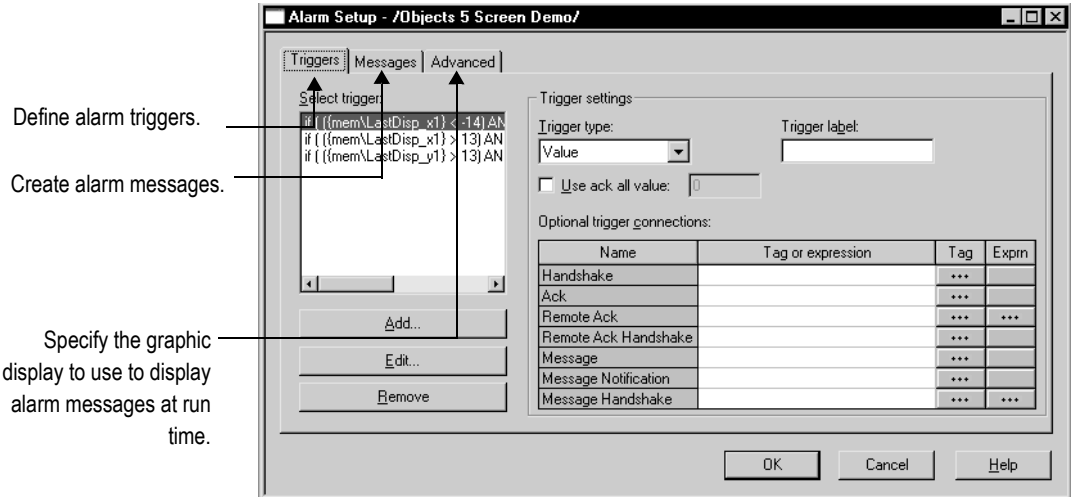
3. If desired, in the Graphics editor modify the default [ALARM] display, or create your own graphic display to use for alarms. For example, if you won't be using audible alarm signals, edit the default display to remove the silence alarms button.

   For information about graphic displays, see Chapter 19.

4. Test alarms on the run-time system.

Setting up alarms

Use the Alarm Setup editor to set up alarms.



For detailed information about the options in the Alarm Setup editor, see Help.

Preparing to set up alarms

As your application is running, information is continually sent to the data source about the state of the various processes. For example, your application might be monitoring whether a valve is open or closed, or the temperature in a boiler. Values representing the status of these processes are sent to the data source.

The first step in setting up alarms is determining which processes to monitor for alarm conditions.

The data source

The FactoryTalk® View documentation uses the term data source as a generic term that includes all possible sources of tag data, for both data server tags and HMI tags. The data source can be memory or a device such as a programmable controller or an OPC® server. FactoryTalk View writes values to and reads values from the data source. The data source is set up to exchange information (in the form of numeric or string values) between FactoryTalk View and the machine that your application is controlling.

Tags and expressions

Before setting up alarms, you must set up data server or HMI tags corresponding to the addresses at the data source that will store the values you want to monitor for alarm conditions. You can monitor analog and digital tags for alarm conditions, including both HMI and data server tags. You cannot monitor string tags.

For information about setting up data server tags, see your OPC data server documentation. For information about creating HMI tags, see Chapter 7.

You can also use expressions to perform logical or mathematical calculations on tag values, and then monitor the expression value rather than the original tag value. For example, you could use an expression to monitor whether a tag value has increased or decreased beyond a threshold value: If Tag1 > 90 then 1 else 2.

For information about creating expressions, see Chapter 23.

Identifying alarm conditions

Once you have identified the processes you want to monitor for alarms, and the tags or expressions that will store the values representing the status of the processes, you must determine the acceptable range of values for each tag or expression. Then you can set up alarms to notify the operator when a value is outside the normal operating range.

Importing and exporting alarm setup files

The Alarm Import Export Wizard in FactoryTalk View Studio allows you to export alarm information to an XML file, and to import an alarm setup XML file.

For example, you can export an application's alarm setup information, import the setup to another FactoryTalk View application, and then modify it in the new application to suit your requirements. Or, you can modify the file before importing it into the new application.

You can use the Alarm Import Export Wizard to import alarm setup information that has been created using an external programming tool or editor, or you can import a FactoryTalk View XML file.

For more information about importing and exporting alarm setup files, see Appendix E.

How alarms work

This section provides an overview of the key components of your application's alarm system, and describes how the different parts work together.

Alarm triggers and trigger values

You specify the tags and expressions (also known as connections) to monitor for alarm conditions by creating an alarm trigger for each connection.

Each alarm trigger can generate one or more alarm messages, associated with different trigger connection values. For each alarm trigger, you specify the trigger values that will generate alarm messages, and create the messages to display for the trigger values.

The trigger value can be a non-zero integer value or a bit position, depending on which trigger data type you assign. For more information about trigger data types, see page 9-11.

Filtering alarm triggers in multiple languages

FactoryTalk View 5.00 and later supports alarm triggers in multiple languages. When you create an alarm trigger, its name is in the current application language. You can export alarm triggers for translation and then import them back into the application. For details, see Chapter 12.

Various graphic objects allow you to specify the alarm triggers to which the object's action applies, using the name of the alarm trigger. This is called filtering alarms. When you translate trigger names into other languages, the default language is used to display the trigger name in the object's selection list. These graphic objects allow you to specify alarm triggers using a selection list called the Trigger Label Selector:

- alarm list
- alarm status list
- alarm banner
- clear alarm history button
- acknowledge all alarms button
- print alarm history button
- print alarm status button

If the trigger label name has not been set up in the default language, the Trigger Label Selector displays a question mark (?) instead of the trigger label name. To correct the display you must import the trigger labels for the default language.

You can also manually type in the trigger label names to use to filter alarms. If you manually type in the trigger names, specify the names in the default language.

If you change the default language, you must re-specify the trigger labels for each of the graphic objects listed above, using the trigger label names in the new default language. For more information about the default language, see page 12-2.

Alarm notification methods

You can use any combination of these methods to notify the operator that an alarm condition has occurred:

- Open an alarm graphic display containing an appropriate alarm message.
- Set off an audible signal (if the application is running on a personal computer).
- Send a message to a printer.
- Send a message to the data source.

If you set up alarm messages in multiple languages, make sure that the data source can either receive the message in Unicode format or convert it into ASCII characters for all the languages you will be using.

To use these methods, select the Display, Audio, Print, and Message to Tag options when you create your messages.

Be sure to select the Print option if you need to keep a permanent record of alarms. You can also print the contents of the alarm log file periodically, as described on page 9-10. (The alarm log file is also referred to as the alarm history.)

Displaying alarm information

FactoryTalk View comes with these alarm displays:

- [ALARM], in the Displays folder, contains an alarm banner graphic object that is set up to display the newest active alarm in the alarm log file.
- [ALARM BANNER], a display in the Libraries folder, contains an alarm banner graphic object that is set up to display the newest active alarm in the alarm log file.
- [ALARM MULTI-LINE], a display in the Libraries folder, contains an alarm list graphic object that is set up to display all the alarms in the alarm log file: active, inactive, acknowledged, and unacknowledged.
- [STATUS], a display in the Libraries folder, contains an alarm status list graphic object that is set up to display active alarms. It contains a goto display button for opening the [HISTORY] display. This display is available in two sizes.
- [HISTORY], a display in the Libraries folder, contains an alarm list graphic object and a goto display button for opening the [STATUS] display. The alarm list is set up to display all the alarms in the alarm log file: active, inactive, acknowledged, and unacknowledged. This display is available in two sizes.

By default, the [ALARM] graphic display opens automatically at run time when an alarm is generated.

You can accept the default, edit the [ALARM] display, use one of the other alarm displays, or create your own display. If you elect not to automatically open a graphic display for alarm notification, an alternative is to provide the operator with a way to open an alarm display when desired.

For more information about	See
The [ALARM] display	page 9-25
The [ALARM BANNER] display	page 9-26
The [ALARM MULTI-LINE] display	page 9-27
The [STATUS] display	page 9-28
The [HISTORY] display	page 9-29
Creating your own alarm display	page 9-31
The alarm list graphic object	page 9-32
The alarm banner graphic object	page 9-33
The alarm status list graphic object	page 9-34

Interacting with alarms

Depending on which alarm objects you set up, the operator can:

- acknowledge one or all alarms, or the alarms for a specific alarm trigger.
- clear and delete alarms.
- silence alarms (if the application is running on a personal computer).
- sort alarms.
- reset the status of all alarms.
- print alarms.

For information about the alarm button graphic objects the operator can use to work with alarms, see page 9-36.

Using the data source to interact with alarms

You can also set up remote acknowledgement, silencing, and resetting of alarms, to allow the data source to perform these functions. And you can set up the data source to determine which types of alarms to display (active, inactive, acknowledged, and unacknowledged), and to close the alarm display. These topics are discussed later in the chapter.

Methods for acknowledging alarms

A single alarm is acknowledged when:

- the operator selects an alarm in the alarm list and presses the acknowledge alarm button, an enter button object, or the Enter key on an external keyboard or keypad.
- the alarm banner has focus and the operator presses the acknowledge alarm button.

A single alarm for a particular trigger is acknowledged when:

- the trigger's Remote Ack connection value changes to the alarm's trigger value (or bit position, for bit triggers).

All alarms for a particular trigger are acknowledged when:

- the trigger's Remote Ack connection value changes to the "Acknowledge all" value. The "Acknowledge all" value is specified in the "Use ack all value" box in the Alarm Setup editor.
- the operator presses an acknowledge all alarms button that is set up to acknowledge the alarms for a specific alarm trigger.

All alarms in the alarm log file are acknowledged when:

- the operator presses an acknowledge all alarms button that is set up to acknowledge all alarms.
- the Remote Ack All connection's value changes to a new non-zero value.

For more information about acknowledging alarms, see page 9-38.

The operator can send button presses to objects that do not have focus. For information about linking buttons to objects, see page 21-9.

Methods for clearing and deleting alarms

Alarms are deleted from the alarm log file and cleared from all alarm lists and alarm banners when the operator presses the clear alarm history button. You can set up the button to clear alarms for all alarms, or for a specific alarm trigger.

The alarm in the alarm banner is cleared when the operator presses the clear alarm banner button. It is not deleted from the alarm log file.

For more information about clearing and deleting alarms, see page 9-40.

Methods for silencing alarms

The audio alarm indicator is available for applications running on personal computers only.

All alarms are silenced when:

- the operator presses the silence alarms button.
- an alarm whose Audio property is turned on is acknowledged.
- the Remote Silence connection's value changes to a new non-zero value.
- the operator presses the clear alarm history button.

Method for sorting alarms

When the operator presses the sort alarms button, the sort order toggles from time to trigger value or from trigger value to time. The sort order applies to all alarms in all alarm lists and in the alarm log file.

Methods for resetting alarms

Resetting alarms affects how alarms are displayed in the alarm status list. When alarms are reset:

- the accumulated time an alarm has been in alarm is reset to 0. If the alarm is still active, the time begins accumulating again.
- the number of times the alarm has been triggered is reset to 0. If the alarm is still active, the number changes to 1.
- the date and time are sent to the system tag AlarmResetDateAndTimeString.

The alarms for a specific alarm trigger are reset when:

- the operator presses a clear alarm history button that has been set up to clear and reset alarms for a specific alarm trigger.

All alarms are reset when:

- the operator presses a reset alarm status button.
- the operator presses a clear alarm history button, if the button has been set up to clear and reset all alarms.
- the Remote Status Reset connection's value changes to a new non-zero value.

For more information about resetting alarms, see page 9-40.

Methods for printing alarm information

In addition to automatically printing each alarm message as it occurs, you can keep a printed record of alarms:

- using the print alarm history button. When the operator presses the button, a report of the contents of the alarm log file is printed. The report can include the time alarms occurred and were acknowledged.

  You can set up this button to print the alarm history for a selected alarm trigger, or for all alarms.

  If you set up alarm messages in multiple languages, messages and trigger labels are printed in the language that they were originally logged in. (Messages are logged in the application language that is current at the time the message is triggered.) All alarm times and acknowledge times are printed in the current application language.

- using the print alarm status button. When the operator presses the button, a report of the status of alarms is printed. The report can include active alarms, past alarms, or all alarms that have been set up in the Alarm Setup editor. The report can include how many times each alarm was triggered, and the accumulated time in alarm.

  You can set up this button to print the alarm status for a selected alarm trigger, or for all alarms.

  If you set up alarm messages in multiple languages, all messages, trigger labels, and times are printed in the current application language.

For information about specifying which printer to use at run time for applications that will run on a personal computer, see page 15-10. For information about the type of printer to use with a PanelView™ Plus or PanelView™ Plus CE terminal, see page 16-1.

The alarm log file

As soon as the application starts running, FactoryTalk View begins monitoring trigger connections for alarm conditions. When an alarm occurs, FactoryTalk View adds the associated message to the alarm log file. When the file is full, the oldest messages are deleted to make room for new messages. Specify the maximum number of messages to store in the Alarm Setup editor.

For each message, the log file records the time the alarm was triggered and the time the alarm was acknowledged (if it was acknowledged).

The log file is saved every 30 seconds, if there are new alarms. The log file is also saved when the application is shut down.

The alarm log file is also referred to as the alarm history. For example, the operator presses the clear alarm history button to remove all alarms from the log file.

The alarm log file is retained when you restart an application after a shutdown or power loss. You can delete the log file from the run-time computer at application startup.

For information about deleting the log file, see page 15-16.

If you download a newer version of an application to the run-time computer, the alarm log file for the older version is deleted automatically.

Alarm trigger data types

When you create alarm triggers, you must specify the type of data the trigger's tag or expression uses. The type of data affects how alarms are triggered.

The Value trigger type

To trigger alarms based on integer or floating-point values, use the Value trigger type. When the value of the trigger connection equals the trigger value of a message, an alarm is generated.

If you use an analog tag (either an HMI tag or a data server tag) or an expression, you can use any non-zero integer or floating-point value to trigger an alarm. Floating-point values are rounded to the nearest integer. For information about how values are rounded, see page 7-2.

Trigger values cannot be 0. Digital tags have two possible values, 0 and 1. Therefore, if you use a digital tag (either an HMI tag or a data server tag) you can only use the value 1 to trigger a message. If you want to use a digital tag to trigger two different messages, create an expression that adds 1 to the digital tag's value. That way, you can use the trigger values 1 and 2.

Example: Integer trigger values

This example shows how to set up alarms using integer trigger values to monitor the level of acid in a 100-gallon tank. Alarms are generated when the tank is 75% full and 90% full.

1. Create an alarm trigger for the tag Acid_tank_level. This tag points to an address in a programmable controller that is linked to a sensor in the tank. The tag's minimum value is 0 and its maximum value is 100.

   Use this expression for the alarm trigger:

   if ((Acid_tank_level > 74) AND (Acid_tank_level < 90))

   then 1

   else if (Acid_tank_level > 89)

   then 2

   else 0

2. Use the Value trigger type for the alarm trigger.
3. Specify these trigger values and alarm messages for the alarm trigger:

Trigger Value	Message
1	Warning! The acid tank has exceeded safe fill levels.
2	Danger! The level in the acid tank is too high.

At run time, when the value of Acid_tank_level is 75 or greater, FactoryTalk View generates the first alarm message. The second message is generated when the tag value is 90 or greater.

Using the expression in step 1 allows a range of values to trigger each alarm. This is useful in case the tag is not being read at the exact moment it reaches a threshold level.

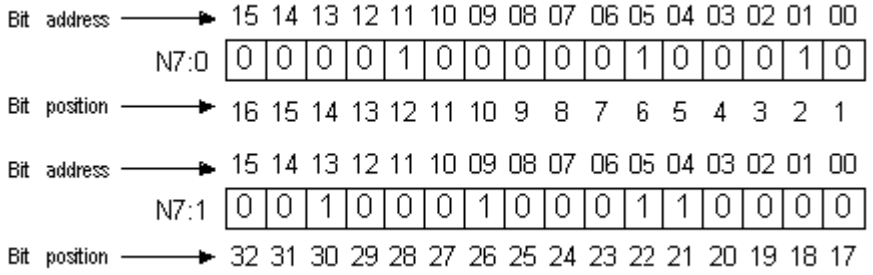
The Bit trigger type

Use the Bit trigger type to generate multiple simultaneous alarm messages. You can assign an array tag (consisting of up to 1,024 bits) to the trigger connection. Each bit in the array whose value changes from 0 to 1 triggers an alarm (if a message is set up for the bit position).

Example: Trigger values using bit positions

This example shows how to use bit positions to generate multiple simultaneous alarms. The array tag uses 32 bits, from N7:0/00 to N7:1/15.

This diagram shows the bit addresses and bit positions for the array tag:



The tag is currently generating alarms at bit positions 2, 6, 12, 21, 22, 26, and 30.

To set up alarms for this array tag:

1. Create an alarm trigger for the array tag. Use the Bit trigger type.

   You must use a direct reference for the array tag. The tag uses the Integer data type (16 bits per element). Append L2 to the tag's starting address to indicate that the trigger will monitor 2 tag elements (32 bits), as follows:

   {::[PLC5]N7:0,L2}

   PLC5 is the RSLinx® Enterprise™ device shortcut name. The two colons at the beginning are necessary when the tag reference contains a colon.

2. Specify trigger values and alarm messages for the alarm trigger. Each trigger value corresponds to a bit position (not a bit address).

Bit in the array (bit address)	Bit position	Trigger value	Message
00	1	1	Line 1: Conveyor has stopped.
01	2	2	Line 1: Power failure.
02	3	3	Line 2: Conveyor has stopped.
03	4	4	Line 2: Power failure.
..	..	..	..
31	32	32	Oven door open.

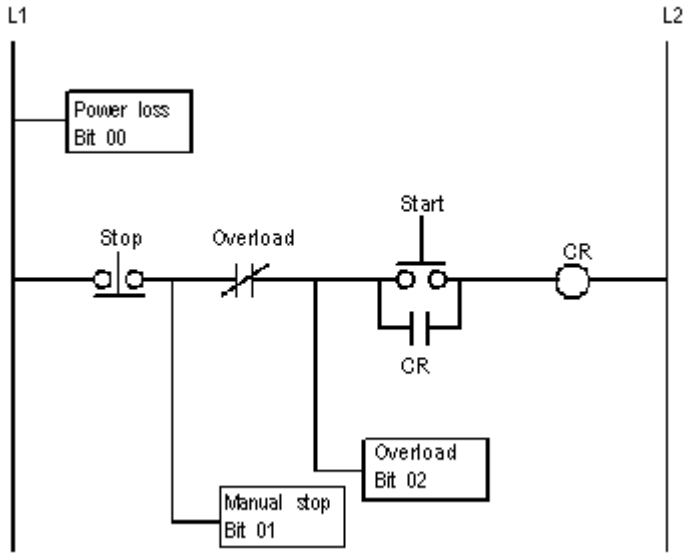
The Least Significant Bit (LSBit) trigger type

Use the Least Significant Bit trigger type to generate alarm messages based on a priority sequence that is determined by bit position. You can assign an array tag (consisting of up to 1,024 bits) to the trigger connection. When multiple bits in the array change from 0 to 1, only the alarm with the lowest bit position is generated.

Example: Trigger values using least significant bits

This example shows how to use the Least Significant Bit trigger type to prioritize which alarm is generated when multiple alarm conditions occur.

In this example, a programmable controller monitors a motor's power, manual stop, and overload status. The diagram indicates the location of sensors that are linked to an array tag in the programmable controller.



If power to the motor is lost, the manual stop and overload switch also lose power, generating alarms for all three motor parts. The only alarm the operator needs to see is the alarm for the motor, since the cause of the alarm is power loss to the motor, not a problem with the other two motor parts.

If someone stops the motor manually, power to the overload switch is lost. Alarms are generated for the manual stop and the overload switch, but the only alarm the operator needs to see is the alarm for the manual stop.

1. Create an alarm trigger for the tag Motor_starter. The tag uses 16 bits, and points to the programmable controller address N7:61, although only the first three bit positions are used in this example. Use the LSBit (Least Significant Bit) trigger type.

   Because you are using only the first three bits in a single tag element, there is no need to specify a length for the array tag in this example. You can use a simple tag type.

   However, if you were also monitoring bits in N7:62, you would need to add L2 to the address, as follows:

   {::[PLC5]N7:61,L2}

2. Specify these trigger values and alarm messages for the alarm trigger:

Bit in the array (bit address)	Bit position	Trigger value	Message
00	1	1	The motor has lost power.
01	2	2	The motor has stopped.
02	3	3	The overload switch has lost power.

At run time, if power to the motor is lost, the programmable controller changes all three bit values from 0 to 1, but FactoryTalk View generates the first alarm message only (since bit 00 is the lowest—that is, least significant—bit in alarm). If the operator acknowledges the first alarm and power is not yet restored, the second alarm is generated, and so on.

Tips for using array tags

You can use these tag data types for array tags:

Data type	Number of bits
Byte	8
Integer	16
Word	16
Long Integer	32
Double Word	32

The right column shows the number of bits for each data type. This is useful for helping to determine how many data elements to address to achieve the required number of bits. To create an array tag, specify how many elements to use, beginning with the first element at the tag's address.

For example, if you want to monitor 128 bit positions for an alarm trigger, and you are using the Long Integer data type, you would append the modifier [4] to the tag name (because 4 x 32 = 128). For detailed information about tag syntax, see page 9-16.

You cannot use HMI tags for array tags. You must use data server tags for array tags.

Equivalent data types

Different processors and OPC servers use different terminology for tag data types. This section provides information about equivalent data types that you can use for array tags, with the associated number of bits for each.

PLC and SLC tags

When creating array tags, you can use PLC and SLC tags with this data type:

Data type	Number of bits
Short Integer	16

Data server tags with the Short Integer data type are displayed in the Tag Browser with the Item Canonical Data Type of Integer.

To view a tag's Item Canonical Data Type

- In the Tag Browser, right-click the tag, and then click Properties.

Logix5000 tags

When creating array tags, you can use Logix5000 tags with these data types:

Data type	Number of bits
SINT	8
INT	16
DINT	32

Data server tags with the data types described in the previous table are displayed in the Tag Browser with the Item Canonical Data Types of Character, Short Integer, and Long Integer, respectively.

RSLinx Enterprise tag syntax

To create an RSLinx Enterprise array tag, use this syntax to specify the length of the array:

*{tagname,***L***arraylength}*

For example, {::[PLC5]N7:0,L5}

The tag N7:0 uses the Short Integer data type (16 bits), so the array tag consists of 80 bits (16 x 5).

When the tag name contains a colon (:), put two colons before the RSLinx Enterprise device shortcut name.

KEPServerEnterprise tag syntax

To create a KEPServerEnterprise array tag, use this syntax to specify the length of the array:

tagname [*arraylength*]

For example, Chan1.Dev1.Tag1 [3]

The tag Tag1 uses the Long Integer data type (32 bits), so the array tag consists of 96 bits (32 x 3).

Alternatively, you can define the tag length in KEPServerEnterprise when you create the tag, and then just select the tag name in FactoryTalk View Studio. For more information, see KEPServerEnterprise Help.

Creating alarm messages in multiple languages

FactoryTalk View 5.00 and later supports alarm messages in multiple languages. When you create alarm messages, they are in the current application language. You can export the alarm messages for translation and then import them back into the application. For details, see Chapter 12.

Language switching alarm messages in FactoryTalk View ME Station 4.00

For applications that will run in FactoryTalk View ME Station version 4.00, use the CurrentLanguage( ) expression function to specify offsets for each trigger's messages in the Alarm Setup editor. In the editor, divide the messages for each trigger into sections for each language. For information about the CurrentLanguage( ) function, see page 23-14.

Optional alarm connections

When an operator acknowledges an alarm, the acknowledge time is recorded in the alarm log file and the alarm is silenced. This might be all you require of your alarm system.

However, you can use the optional alarm connections in the Alarm Setup editor to set up more sophisticated interactions with the data source when alarms are triggered, acknowledged, silenced, and reset. For example, you can set up the data source to acknowledge, silence, and reset alarms. You can also use optional alarm connections to close the alarm display or to allow the data source to close the alarm display.

There are two sets of optional alarm connections:

- connections that work with a specific alarm trigger. You can assign a different set of connections to each alarm trigger.
- connections that apply to all alarms

You can also assign connections to alarm lists, to allow the data source to determine which types of alarms to display in the lists. For more information, see page 9-32.

Connections that work with a specific alarm trigger

You can assign a different set of these connections to each alarm trigger, or to only one or some alarm triggers:

- Handshake—Assign a tag to this connection to notify the data source when the trigger's value changes.
- Ack—Assign a tag to this connection to notify the data source when the operator acknowledges an alarm (or all alarms).
- Remote Ack—Assign a tag or an expression to this connection to allow the data source to acknowledge alarms.
- Remote Ack Handshake—Assign a tag to this connection to notify the data source when a remote acknowledgement occurs.
- Message—Assign a tag to this connection to send alarm messages to the connection. Make sure the tag supports the type of data sent in the alarm message. For example, if the message is a string of text, assign a string tag to the Message connection.
- Message Notification—Assign a tag to this connection to notify FactoryTalk View that an alarm message has been sent to the connection and FactoryTalk View must wait before sending a new message.
- Message Handshake—Assign a tag to this connection if you want the data source to notify FactoryTalk View when it has read the message.

Assign tags or expressions to these connections when you create your alarm triggers. For more detailed information about how these connections work, see the next sections.

How the Handshake connection works

The Handshake connection is useful for triggers that use the Value data type. Program the data source to queue alarm notifications when multiple alarms are generated for the same trigger. Use the Handshake connection to notify the data source that FactoryTalk View has detected the alarm notification. Then the data source can send the next alarm to FactoryTalk View.

When the application starts, the Handshake connection has a value of 1. When the trigger connection's value changes, the Handshake connection's value toggles from 1 to 0. The next time the trigger value changes, the Handshake connection's value toggles from 0 to 1.

A change in the trigger connection's value does not necessarily indicate an alarm—the value might still be within acceptable limits.

How the Ack connection works

When the application starts, this connection has a value of 0.

How the value changes

- When the operator acknowledges an alarm by pressing the acknowledge alarm button, FactoryTalk View sends the alarm's trigger value (or bit position, for bit triggers) to this connection, and holds the value as long as the operator presses the button, or for the duration of the hold time, whichever is longer. Then the connection's value is reset to 0.
- When the operator acknowledges all alarms, or the alarms for this trigger only, by pressing the acknowledge all alarms button, FactoryTalk View sends the trigger's "Acknowledge all" value to this connection, and holds the value as long as the operator presses the button, or for the duration of the hold time, whichever is longer. Then the connection's value is reset to 0.
- When the Remote Ack connection changes to a new non-zero value that matches the trigger value of an unacknowledged alarm, FactoryTalk View sends the trigger's value (or bit position, for bit triggers) to this connection, and holds the value for the duration of the hold time. Then the connection's value is reset to 0.

To avoid confusion about whether a specific trigger's alarm individual alarm has been acknowledged or all alarms for the trigger have been acknowledged, make sure the "Acknowledge all" value is not the same as one of the trigger values.

How the Remote Ack connection works

The Remote Ack connection allows for the remote acknowledgement of alarms. The data source writes the alarm's trigger value (or bit position, for bit triggers) to this connection, and the unacknowledged alarm with this trigger value is acknowledged.

If you assign this connection and specify an "Acknowledge all" value for the trigger, when the data source sends the "Acknowledge all" value to this connection, all unacknowledged alarms for the trigger are acknowledged.

Make sure that the "Acknowledge all" value is not the same as one of the trigger values.

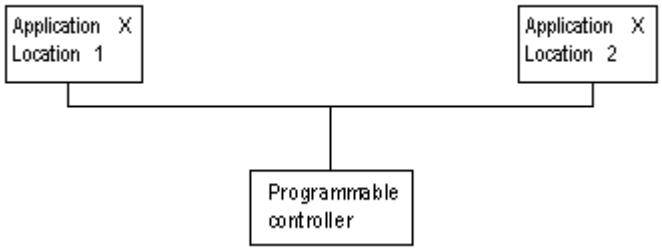
Set up the data source to send the correct value to the Remote Ack connection when you want a remote acknowledgement to take place.

Remote acknowledgement does not take place if the hold time is in effect for the Ack connection.

Example: Using the Remote Ack connection

This example shows how to use the Remote Ack connection to acknowledge an alarm.

In this example, the same application is run at two different locations on the plant floor, and both terminals are connected to the same programmable controller. All the tags in the example refer to addresses in the programmable controller.



1. Create an alarm trigger for a tag called Alarm. Use the Value trigger type.
2. Assign a tag called Ack to the Ack connection.
3. Assign a tag called Remote_ack to the Remote Ack connection.
4. Create an alarm message for the alarm trigger, with the trigger value 1.
5. Set up the data source to write the value at the Ack connection to the Remote Ack connection whenever the value of the Ack connection changes from 0 to a non-zero value.

At run time, when an alarm with the trigger value 1 is generated, the alarm message appears at both locations simultaneously. If the operator acknowledges the alarm at Location 1, FactoryTalk View writes the value 1 to the Ack connection.

Since the Ack connection is write-only (not read), the acknowledgement doesn't appear at Location 2. However, the programmable controller writes the value from the Ack connection (1) to the Remote Ack connection, and the alarm at Location 2 is acknowledged.

How the Remote Ack Handshake connection works

This connection is used to notify the data source that the remote acknowledgement has been detected by FactoryTalk View.

When the application starts, the Remote Ack Handshake connection has a value of 1. When the Remote Ack connection value changes, the Remote Ack Handshake connection's value toggles from 1 to 0. The next time the Remote Ack value changes, the Remote Ack Handshake value toggles from 0 to 1.

The Remote Ack Handshake value toggles whether or not the new Remote Ack value matches a trigger value.

Ensuring alarm messages are read by the data source before sending new messages

This section explains how the Message, Message Notification, and Message Handshake connections work.

To ensure an alarm message is read by the data source before FactoryTalk View sends a new message, use message handshaking. While message handshaking is in effect for an alarm message, FactoryTalk View cannot send a new message to the alarm trigger's Message connection.

Methods of alarm message handshaking

Alarm handshaking works by setting the alarm trigger's Message Notification connection to 1. As long as the Message Notification connection is set to 1, new messages cannot be sent to the Messages connection. How the Message Notification connection is reset to 0 depends on how you set up alarm message handshaking.

There are two ways you can use alarm message handshaking:

- to hold the message at the data source for a specific period of time.
- to hold the message at the data source until the data source notifies FactoryTalk View that the message has been read.

Choose the method that best suits your application needs and communication system.

Holding the message for a specific period of time

To set up an alarm trigger's alarm message handshaking so that the message at the Message connection is held for a specific period of time, assign a tag to the Message Notification connection and specify a hold time in the Advanced tab of the Alarm Setup editor.

How handshaking works

This method of alarm message handshaking works as follows:

1. When an alarm occurs, the alarm message is sent to the Message connection.
2. The Message Notification connection is set to 1.

   As long as the Message Notification connection is set to 1, FactoryTalk View cannot send new messages to the data source.
3. The "hold time" timer begins timing.
4. When the hold time has expired, the Message Notification connection is reset to 0 and FactoryTalk View can send a new message to the Message connection.

Holding the message until the data source acknowledges that it has read the message

To set up an alarm trigger's alarm message handshaking so that the message at the Message connection is held until the data source notifies FactoryTalk View that it has read the message, use two connections: the Message Notification connection and the Message Handshake connection.

Set up the data source to send a new non-zero value to the Message Handshake connection when it has read the message at the Message connection.

How handshaking works

If you use the Message Handshake connection, handshaking works like this:

1. When an alarm occurs, the alarm message is sent to the Message connection.
2. The Message Notification connection is set to 1.

   As long as the Message Notification connection is set to 1, FactoryTalk View cannot send new messages to the data source.
3. When the data source has read the message, it sends a new non-zero value to the Message Handshake connection.
4. The Message Notification connection is reset to 0 and FactoryTalk View can send a new message to the Message connection.

How messages are queued

FactoryTalk View can queue up to 128 messages while it waits for the Message Notification connection to be reset to 0. Queued messages are sent to the data source on a first in, first out basis.

If the alarm message queue fills before the Message Notification connection is reset to 0, an error message is sent to FactoryTalk® Diagnostics.

How the Message connection works

This connection is used to send the message associated with a trigger value to the data source.

The message is sent only if the alarm message's Message to Tag option is selected.

If you are going to generate text alarm messages in multiple languages, make sure the tag assigned to this connection can accommodate the string length of the messages in each language. For information about using multiple languages, see Chapter 12.

How the Message Notification connection works

This connection is used to notify FactoryTalk View that an alarm message has been sent to the data source and FactoryTalk View must wait to send another message.

When the application starts, the Message Notification connection is set to 0. When a message is written to the Message connection, the Message Notification connection value changes to 1. When the hold time expires, or the Message Handshake connection changes to a new non-zero value, the Message Notification connection value changes from 1 to 0.

Messages for an alarm trigger are queued if the Message Notification connection is set to 1.

How the Message Handshake connection works

Use the Message Handshake connection to reset the Message Notification connection when the data source has read the alarm message.

Set up the data source to send a new non-zero value to the Message Handshake connection when it has read the message at the Message connection.

Connections that apply to all alarms

These connections apply to all alarms:

- Silence—Assign a tag to this connection to notify the data source that all alarms have been silenced (for applications that will run on a personal computer only).
- Remote Silence—Assign a tag or an expression to this connection to allow the data source to silence all alarms (for applications that will run on a personal computer only).
- Remote Ack All—Assign a tag to this connection to allow the data source to acknowledge all alarms at once.

- Status Reset—Assign a tag to this connection to notify the data source that the alarm status has been reset.
- Remote Status Reset—Assign a tag or expression to this connection to allow the data source to reset the alarm status.
- Close Display—Assign a tag to this connection to notify the data source that the alarm display has closed.
- Remote Close Display—Assign a tag or expression to this connection to allow the data source to close the alarm display.

Assign tags or expressions to these connections in the Advanced tab of the Alarm Setup editor. For more detailed information about how these connections work, see the next sections.

How the Silence connection works

When the application starts, this connection has a value of 0. When alarms are silenced, this connection is set to 1 for the hold time and the internal beeper is turned off. At the end of the hold time, the connection is reset to 0.

If the silence event is triggered by a button press, this connection is set to 1 for the hold time or for the duration of the button press, whichever is longer. At the end of this time, the connection is reset to 0.

If subsequent alarms (that have been set up to sound the internal beeper) are generated, the alarms sound the beeper regardless of the Silence connection value or hold time status.

While the hold time is in effect, new alarms cannot be silenced.

How the Remote Silence connection works

When this connection changes to a new non-zero value, all alarms are silenced. Alarms can be silenced using other methods regardless of this connection's value.

Set up the data source to send a new non-zero value to the Remote Silence connection each time you want a remote silencing of alarms to take place.

How the Remote Ack All connection works

When this connection changes to a new non-zero value, all unacknowledged alarms are acknowledged.

Set up the data source to send a new non-zero value to the Remote Ack All connection each time you want a remote acknowledgement of all alarms to take place.

How the Status Reset connection works

When the application starts, this connection has a value of 0. If a reset alarm status or clear alarm history button is pressed, this connection is set to 1 for the hold time or for the duration of the button press, whichever is longer. At the end of this time, the connection is reset to 0.

The Status Reset connection is also set to 1 if the Remote Status Reset connection changes to a new non-zero value, and remains set for the hold time.

While the hold time is in effect, the alarm status cannot be reset again. The status of alarms keeps updating during the hold time.

How the Remote Status Reset connection works

When this connection changes to a new non-zero value, the status of all alarms is reset, as described on page 9-9. Alarms can be reset using other methods regardless of this connection's value.

Set up the data source to send a new non-zero value to the Remote Status Reset connection each time you want a remote resetting of alarm status to take place.

How the Close Display connection works

When the application starts, this connection has a value of 0. If the alarm display (assigned in the Alarm Setup editor) closes, this connection is set to 1 for the hold time. At the end of the hold time, the connection is reset to 0.

If subsequent alarms are generated, the alarm display opens again regardless of the Close Display connection value or hold time status.

How the Remote Close Display connection works

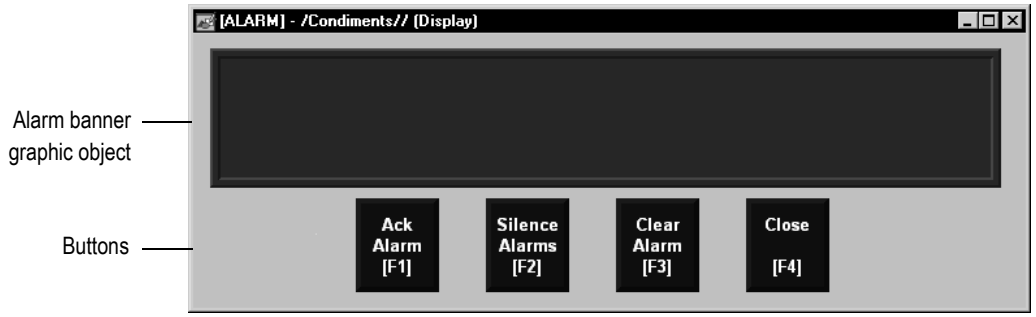
When this connection changes to a new non-zero value, the alarm display closes. The alarm display can be closed using other methods regardless of this connection's value.

Set up the data source to send a new non-zero value to the Remote Close Display connection each time you want a remote closing of the alarm display to take place.

The [ALARM] display

When you create an application, it comes with a graphic display called [ALARM]. The [ALARM] display is the default display for showing alarm messages at run time. It contains an alarm banner graphic object that is set up to display a single active alarm.

You can use the [ALARM] display as is, or modify the display. For example, you can change the color of the objects, or add and remove buttons.



Another option is to create your own graphic display to use when an alarm occurs, as described on page 9-31. Or, you can use one of the alarm displays in the graphic library. These displays are described in the next four sections.

A copy of the [ALARM] display is included in the graphic library, with the name [ALARM BANNER].

The alarm banner graphic object

The [ALARM] display contains an alarm banner graphic object, which lists the most recent alarm message. You can set up the alarm banner to queue new alarms until the displayed alarm has been acknowledged, or to show new alarms as they occur. The alarm banner in the [ALARM] display is set up to display new alarms as they occur and to display active alarms only (but you can edit it, if desired).

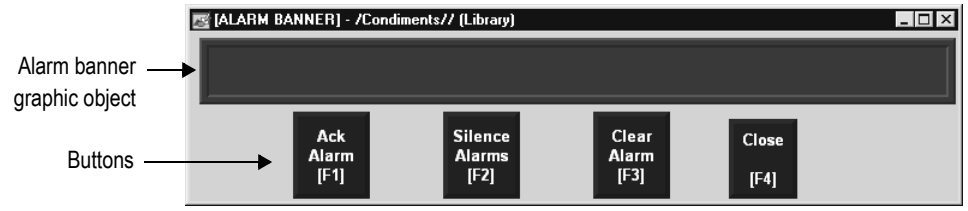
For more information about the alarm banner, see page 9-33.

Buttons in the [ALARM] display

The [ALARM] display contains alarm buttons for acknowledging, silencing, and clearing alarms, as well as a button for closing the display. For information about how the buttons work, see page 9-36.

The [ALARM BANNER] display

The Libraries folder contains a graphic display called [ALARM BANNER]. The [ALARM BANNER] display allows the operator to see a single alarm at a time.



The alarm banner graphic object

The [ALARM BANNER] display contains an alarm banner graphic object, which lists the most recent alarm message. You can set up the alarm banner to queue new alarms until the displayed alarm has been acknowledged, or to show new alarms as they occur. The alarm banner in the [ALARM BANNER] display is set up to display new alarms as they occur and to display active alarms only (but you can edit it, if desired).

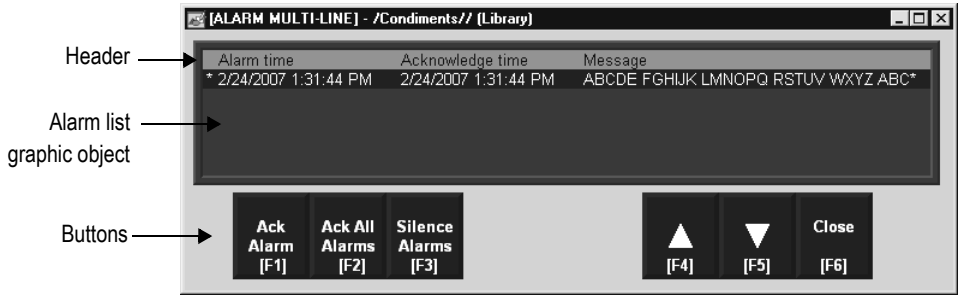
For more information about the alarm banner, see page 9-33.

Buttons in the [ALARM BANNER] display

The [ALARM BANNER] display contains alarm buttons for acknowledging, clearing, and silencing alarms, as well as a button for closing the display. For information about how the buttons work, see page 9-36.

The [ALARM MULTI-LINE] display

The Libraries folder contains a graphic display called [ALARM MULTI-LINE]. The [ALARM MULTI-LINE] display allows the operator to see multiple alarms at once.



You can use the [ALARM MULTI-LINE] display as is, or modify the display. For example, you can select which alarm triggers' alarms to display in the list.

The alarm list graphic object

The [ALARM MULTI-LINE] display contains an alarm list graphic object, which lists the time the alarms occurred and were acknowledged, as well as the alarm messages. You can set up the alarm list to show any combination of active, inactive, acknowledged, and unacknowledged alarms. The alarm list in the [ALARM MULTI-LINE] display is set up to show all alarms (but you can edit it, if desired).

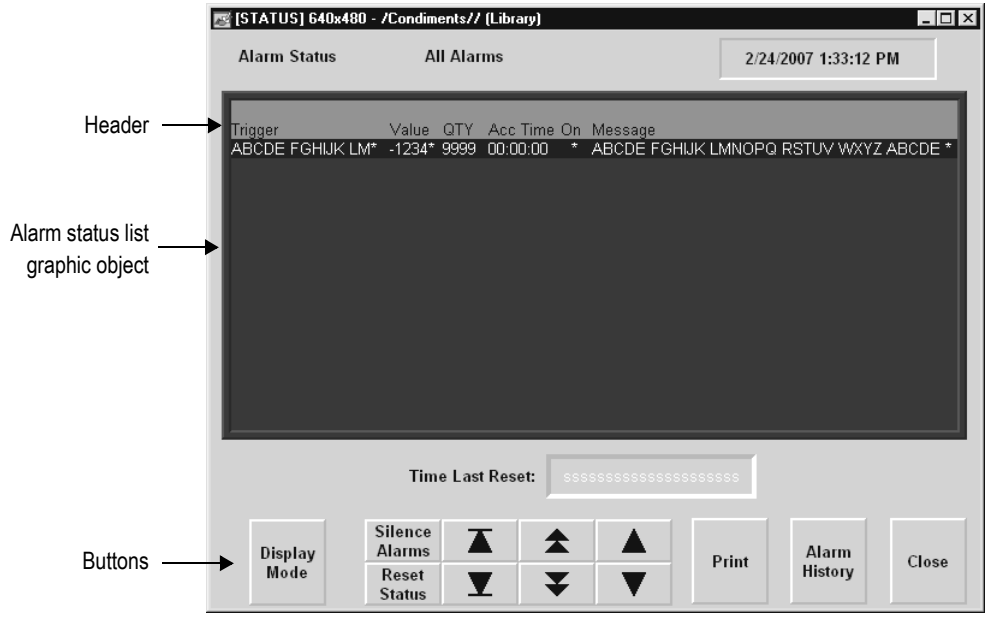
For more information about the alarm list, see page 9-32.

Buttons in the [ALARM MULTI-LINE] display

The [ALARM MULTI-LINE] display contains alarm buttons for acknowledging and silencing alarms, as well as buttons for scrolling the list and closing the display. For information about how the buttons work, see page 9-36.

The [STATUS] display

The Libraries folder contains a graphic display called [STATUS]. The [STATUS] display allows the operator to see the status of all the alarms that have been set up in the Alarm Setup editor. The [STATUS] display comes in two sizes, 640x480 and 800x600.



You can use the [STATUS] display as is, or modify the display. For example, you can select which alarm triggers' alarms to display in the list, or remove buttons that you don't want to use.

The alarm status list graphic object

The [STATUS] display contains an alarm status list graphic object, which lists the alarm messages. You can set up the alarm status list to show the status of all alarms that have been set up, active alarms only, or all alarms that have occurred since the alarm status was last reset. The alarm status list in the [STATUS] display is set up to show the status of active alarms (but you can edit it, if desired).

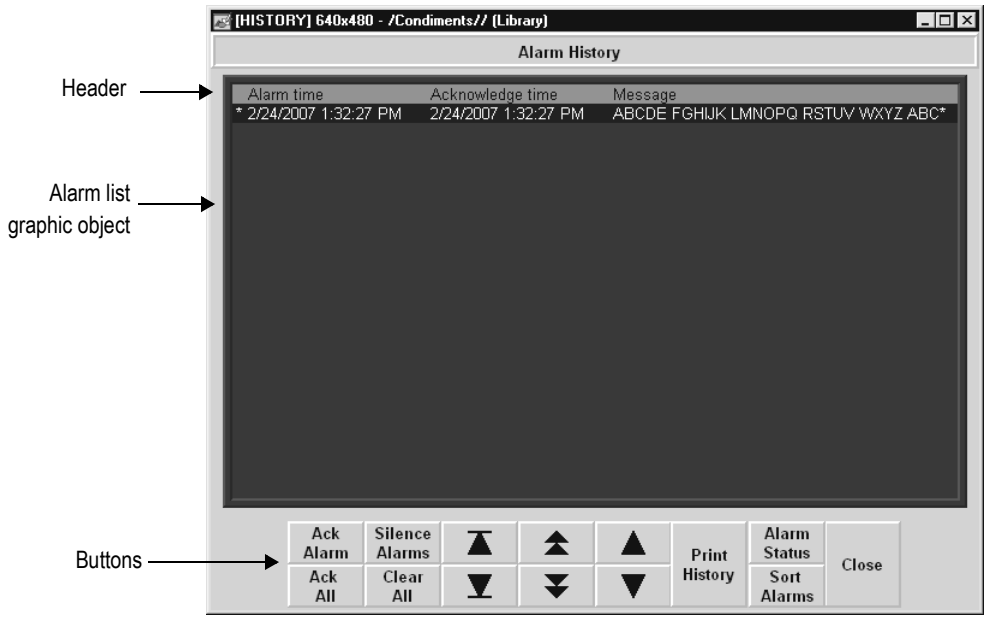
For more information about the alarm status list, see page 9-34.

Buttons in the [STATUS] display

The [STATUS] display contains alarm buttons for resetting and silencing alarms, changing the display mode, printing the status of alarms, and opening the [HISTORY] display, as well as buttons for scrolling the list and closing the display. For information about how the buttons work, see page 9-36.

The [HISTORY] display

The Libraries folder contains a graphic display called [HISTORY]. It is similar to the [ALARM MULTI-LINE] display, but the alarm list graphic object is larger (to display more alarm messages at once), and the [HISTORY] display contains more buttons. The [HISTORY] display comes in two sizes, 640x480 and 800x600.



You can use the [HISTORY] display as is, or modify the display. For example, you can select which alarm triggers' alarms to display in the list, or remove buttons that you don't want to use.

The alarm list graphic object

The [HISTORY] display contains an alarm list graphic object, which lists the time the alarms occurred and were acknowledged, as well as the alarm messages.

You can set up the alarm list to show any combination of active, inactive, acknowledged, and unacknowledged alarms. The alarm list in the [HISTORY] display is set up to show all alarms (but you can edit it, if desired).

For more information about the alarm list, see page 9-32.

Buttons in the [HISTORY] display

The [HISTORY] display contains alarm buttons for acknowledging, silencing, and clearing alarms, sorting the list of alarms, printing the alarm history list, and opening the [STATUS] display, as well as buttons for scrolling the list and closing the display. For information about how the buttons work, see page 9-36.

Using displays from the library in your application

The previous four sections described the [ALARM BANNER], [ALARM MULTI-LINE], [STATUS], and [HISTORY] displays that are included in the Libraries folder. You can copy objects from the displays to your own display, or you can copy the entire displays into your application.

For information about copying objects from a library into your graphic display, see page 20-40.

The graphic libraries are available on the development computer, but do not appear at run time. To use a display in the library as a graphic display at run time, you must add the library display into your application's folder of graphic displays. For details, see page 19-17.

Example: Using the [ALARM] and [STATUS] displays together

To use the [ALARM] display to alert the operator about alarms as they occur, and the [STATUS] display to show how many times and for how long alarms have been active:

1. In the Alarm Setup editor, in the Advanced tab, select the [ALARM] display as the display to open when alarms are triggered, if it is not already selected. (It is selected by default.)
2. Add the [STATUS] display from the library.
3. Edit the [ALARM] display by adding a goto display button that opens the [STATUS] display when pressed.

Creating your own alarm display

You can create your own graphic display for displaying and responding to alarms. For example, you could create a display with a static text object that notifies the operator that an alarm has occurred, and a goto display button that the operator can press to open a display that lists the actual alarm message.

If you create your own graphic display, use an On Top display and select the Cannot Be Replaced option.

For information about the graphic objects you can use to display alarm information, see the information starting on page 9-32. For information about creating graphic displays and graphic objects, see Chapter 19 and Chapter 20.

Opening and closing the alarm display

Opening the display

The alarm display you specify in the Advanced tab of the Alarm Setup editor (either the default [ALARM] display, a display you copy from the library, or your own display) is automatically opened whenever a trigger connection's value matches a trigger value (if you selected the Display option for the trigger value).

You can also create a goto display button that the operator can press to open the alarm display. For information about setting up a goto display button and specifying the display to open, see Help.

Closing the display

The operator can close the display by pressing a close display button.

The display closes automatically under these circumstances:

- when the operator presses an acknowledge all alarms button and causes the newest alarm in the alarm history to be acknowledged.
- when the operator presses a clear alarm history button and causes the newest alarm in the alarm history to be deleted.
- when the Remote Close Display connection changes to a new non-zero value.
- when the Remote Ack All connection changes to a new non-zero value.
- when the newest alarm is acknowledged.

If you don't want the display to close when the newest alarm is acknowledged, you can turn off this option in FactoryTalk View ME Station.

To change how the display closes

1. In FactoryTalk View ME Station, click Terminal Settings.
2. Double-click Alarms.
3. Specify how you want the display to close.

How the alarm list graphic object works

The alarm list graphic object displays the time an alarm was triggered, and the time it was acknowledged (if you set up the object to display acknowledged alarms).

At run time, when a trigger connection at the data source matches a message's trigger value, an alarm appears in the alarm list. The alarm list can be in the [ALARM MULTI-LINE] or [HISTORY] display, in an alarm display you have created, or can be placed on any display in your application.

You can use multiple alarm lists, in the same display or in different displays. Each alarm list displays information from the same alarm log file, although you can set up different lists to display different information.

For information about setting up alarm lists, see Help.

What is displayed

- If you set up the list to show the alarms for specific alarm triggers, only alarms for those triggers are displayed.
- If the list is set up to show unacknowledged alarms only, the alarms displayed in the list are unacknowledged and the acknowledge time column, if any, is always blank.
- If the list is set up to show both acknowledged and unacknowledged alarms, acknowledged alarms can show a symbol (which you can specify) at the left end of the row, and the acknowledge time appears in the acknowledge time column, if displayed.
- If the list is set up to show both active and inactive alarms, active alarms can show a symbol (which you can specify) at the left end of the row. If both the acknowledge symbol and active symbol are displayed, the active symbol column is to the right of the acknowledge symbol column.
- If the message is too long to fit in the object, the last displayed character is replaced with an asterisk. Similarly, if a column heading is too long to fit in the column, the last displayed character is replaced with an asterisk. You can specify how many lines to allow for each alarm message, from 1 to 10.
- The number of alarm messages that fits in the display depends on the height of the alarm list, the list's font size, how many lines you have specified for each alarm message, and whether the column headings are displayed.

- If alarms are currently being sorted by time, alarms are listed with the newest alarms on top.
- If alarms are currently being sorted by trigger value, alarms from the first trigger in the Alarm Setup editor are listed first, with alarms from subsequent triggers listed after. Alarms in the list from the same trigger are grouped together and then sorted by trigger value, from lowest to highest.
- If there are multiple instances of the same alarm, these alarms are sorted by time with the newest on top.
- If you assign a tag or expression to any of the ActiveAcknowledged, ActiveUnacknowledged, InactiveAcknowledged, or InactiveUnacknowledged connections, when a connection's value is a non-zero value, the related type of alarm is displayed in the alarm list. The connection value overrides the setting for the list in the Alarm List Properties dialog box.
- If you set up alarm messages in multiple languages, messages are displayed in the language that they were originally logged in. All alarm and acknowledgement times are displayed in the current application language.

How the list scrolls

- When a display containing an alarm list is opened, the highlight bar or cursor is at the top of the list: on the most recent alarm if sorted by time; or on the first alarm for the first trigger, if sorted by trigger value.
- If alarms are sorted by time, and the top alarm is selected, as new alarms occur, the old alarms scroll down, but the highlight bar or cursor remains at the top.
- If alarms are sorted by time, when the operator selects an alarm other than the top one in the list (by using the move down button), and new alarms occur, they are added above the visible area if the list is full. The currently selected alarm continues to be selected and maintains its position in the displayed portion of the list.
- If alarms are sorted by trigger value, as new alarms occur the currently selected alarm continues to be selected and maintains its position in the list.
- If the sort order changes, the selected alarm continues to be selected, but it might be displayed in a different position in the list.

How the alarm banner graphic object works

The alarm banner graphic object displays a single, unacknowledged alarm.

At run time, when a trigger connection at the data source matches a message's trigger value, an alarm appears in the alarm banner. The alarm banner can be in the [ALARM]

display or [ALARM BANNER] display, in an alarm display you have created, or can be placed on any display in your application.

You can use multiple alarm banners, in the same display or in different displays. You can set up different banners so that one displays the most recent alarm, and the other queues alarms until the displayed alarm is acknowledged.

For information about setting up alarm banners, see Help.

What is displayed

- If you set up the banner to show the alarms for specific alarm triggers, only alarms for those triggers are displayed.
- You can set up the banner to queue new alarms until the operator clears the current alarm, or to always display the most recent alarm.
- When a display containing an alarm banner is first opened, the alarm banner is blank, unless the display is the alarm display specified in the Alarm Setup editor and it was opened in response to an alarm.
- When the displayed alarm is acknowledged, it is removed from the alarm banner. If there are no newer alarms, the banner is blank.
- If the operator presses a clear alarm banner button, the banner is blank.
- If the operator presses a clear alarm history button or if all alarms are acknowledged, the banner is blank.
- If the banner is set up to show both active and inactive alarms, when an alarm is active, an asterisk (*) appears beside the message.
- If you set up alarm messages in multiple languages, messages and trigger labels are displayed in the language that they were originally logged in. All alarm times are displayed in the current application language.

How the alarm status list graphic object works

The alarm status list graphic object displays the status of alarms, including whether an alarm has been triggered, how many times an alarm has been triggered, and for how long.

The alarm status list can be in the [STATUS] display, in an alarm display you have created, or can be placed on any display in your application.

You can use multiple alarm status lists, in the same display or in different displays. You can set up different lists to display different information.

For information about setting up alarm status lists, see Help.

What is displayed

- If you set up the list to show the alarms for specific alarm triggers, only alarms for those triggers are displayed.
- If an alarm is active, an asterisk (*) appears in the alarm state column, if displayed.
- If the message is too long to fit in the object, the last character that would fit is replaced with an asterisk. Similarly, if a column heading is too long to fit in the column, the last character that would fit is replaced with an asterisk. You can specify how many lines to allow for each alarm message, from 1 to 10.
- The number of alarm messages that fits in the display depends on the height of the alarm status list, the list's font size, how many lines you have specified for each alarm message, and whether the column headings are displayed.
- For value-triggered alarms, the accumulated time column shows how long the alarm has been set to the trigger value.
- For bit-triggered alarms, the accumulated time column shows how long the bit has been set to 1.
- For LSBit-triggered alarms, the accumulated time column shows how long the corresponding alarm's least significant bit has been set to 1.
- If you set up alarm messages in multiple languages, all messages and trigger labels are displayed in the current application language, regardless of what language they were originally logged in.

What happens when the display is opened

- The first time a display containing the alarm status list is opened, the first page of alarms is displayed.
- If the list is set up to display active alarms only, and alarms that were visible when the display was closed are no longer active, the alarms are removed from the list.
- If alarms have been reset since the display was last opened, the first page of alarms is displayed.

Using buttons with the alarm history and alarm objects

Alarm buttons

You can use these alarm buttons to interact with the alarm list, alarm banner, or alarm status list, and to clear and sort the alarm history:

Use this button	With this graphic object	To do this
Acknowledge alarm	Alarm list Alarm banner	Acknowledge and silence the selected alarm.
Acknowledge all alarms		Acknowledge and silence all currently unacknowledged alarms, or the currently unacknowledged alarms for a specific alarm trigger.
Alarm status mode	Alarm status list	Change the type of alarms displayed in the alarm status list, from all alarms to active alarms to past alarms.
Clear alarm banner	Alarm banner	Clear the alarm in the alarm banner without removing the alarm from the alarm log file and alarm lists.
Clear alarm history		Remove alarms from the alarm log file and all alarm lists. If the Ack connection is assigned for any of the alarm triggers, the operator is prompted to acknowledge all alarms before clearing them. You can set up the button to remove all alarms, or just the alarms for a specific alarm trigger. You can also specify whether to reset the cleared alarms. If you choose to reset alarms, pressing this button resets the number of times an alarm has been triggered to 0, and the accumulated time in alarm to 0, for all alarms that are being cleared. If the alarm is still active, the number of times in alarm changes to 1 after the alarm is reset to 0.

Use this button	With this graphic object	To do this
Print alarm history		Print a report of the alarm messages in the alarm log file. You can include all alarms, or just the alarms for a specific alarm trigger. The report can include the time alarms occurred and were acknowledged.
Print alarm status		Print a report of the status of alarms. You can include all alarms, or just the alarms for a specific alarm trigger. The report can include how many times each alarm was triggered, and the accumulated time in alarm.
Reset alarm status		Reset the number of times an alarm has been triggered to 0, and the accumulated time in alarm to 0, for all alarms. If the alarm is still active, the number changes to 1.
Silence alarms		Silence the audio indictor for all alarms (for applications that will run on a personal computer only).
Sort alarms		Toggle between sorting alarms in alarm lists and the alarm log file by time and by trigger value.

You can assign any caption you choose to the labels on the alarm buttons.

Linking buttons to objects

You can link the acknowledge alarm button to a specific alarm list or alarm banner, or set up the button to work with whichever alarm list or alarm banner is selected in the graphic display.

Similarly, you can link the clear alarm banner button to a specific alarm banner. This option is useful if you have multiple alarm banners in the same graphic display. And you can link the alarm status mode button to a specific alarm status list.

For more information about linking buttons to objects, see page 21-9.

Key buttons

You can also use these key button graphic objects to interact with the alarm list, alarm status list, or alarm banner:

This button	Does this
Move up	Scrolls up one row in the list.
Move down	Scrolls down one row in the list.
Page up	Moves the highlight bar or cursor up one page in the list.
Page down	Moves the highlight bar or cursor down one page in the list.
Home	Moves the highlight bar or cursor to the top alarm in the list.
End	Moves the highlight bar or cursor to the bottom alarm in the list.
Enter	Acknowledges the currently selected alarm (in alarm lists and alarm banners).

You can link key buttons to a specific alarm object, or set up the buttons to work with whichever object is selected in the graphic display. For more information, see page 21-9.

For information about creating graphic objects, see Chapter 20. For information about setting up key buttons, see Help.

Using alarm buttons to acknowledge, silence, clear, and delete alarms

Acknowledging messages does not remove them from the alarm log file. You can still display acknowledged alarms in an alarm list that is set up to show acknowledged alarms.

Acknowledging the selected alarm

When the operator presses the acknowledge alarm button, an enter button, or the Enter key on an external keyboard or keypad:

- the selected alarm in the alarm list is acknowledged and the audio indicator for the alarm, if any, is silenced.
- the displayed alarm in the alarm banner is acknowledged and the audio indicator for the alarm, if any, is silenced.

This is what happens when the alarm is acknowledged:

- If assigned, the alarm trigger's Ack connection is set to the alarm trigger value at the data source. The value is held as long as the operator presses the button, or for the hold time, whichever is longer.

If the hold time is still in effect and the operator acknowledges a new instance of the same alarm, the new acknowledgement is ignored.

- If the alarm list is set up to display unacknowledged alarms only, the alarm is removed from the list. The highlight bar or cursor moves up to the next unacknowledged alarm, unless it is already on the top unacknowledged alarm.
- If the highlight bar or cursor is on an acknowledged alarm when the operator presses the acknowledge alarm button, the button press is ignored.
- The alarm is removed from the alarm banner.

Acknowledging all alarms

When the operator presses an acknowledge all alarms button, all unacknowledged alarms in the system (or, optionally, for a specific alarm trigger), are acknowledged.

This is what happens when the alarms are acknowledged:

- For each alarm trigger to which an “Acknowledge all” value is assigned, the specified “Acknowledge all” value is sent to the trigger’s Ack connection. The value is held as long as the operator presses the button, or for the hold time, whichever is longer. Then the connection’s value is reset to 0.

  If the “Acknowledge all” value is not assigned for a trigger, no value is sent to the trigger’s Ack connection.

  If the hold time for any alarm is still in effect and the operator presses acknowledge all alarms, the button press is ignored.
- If the alarm list is set up to display unacknowledged alarms only, all acknowledged alarms are removed from the list.
- The alarm banner is cleared.

Silencing alarms

When the operator presses the silence alarms button, any audible signal triggered by an alarm is silenced and the Silence connection is set to 1 for the hold time or for the duration of the button press, whichever is longer. Then the connection’s value is reset to 0.

If the hold time for any alarm is still in effect and the operator presses silence alarms, the button press is ignored.

The audio alarm indicator is available for applications running on personal computers only.

Clearing and deleting messages

From the alarm history

When the operator presses the clear alarm history button, all alarms in the system (or, optionally, for a specific alarm trigger) are deleted from the alarm log file and from all alarm lists. For information about the alarm log file, see page 9-10.

If the Ack connection is assigned for any of the alarm triggers being cleared, the operator is prompted to acknowledge the unacknowledged messages before deleting them. If the operator chooses to acknowledge the alarms, the "Acknowledge all" value (if any) is sent to the Ack connection before deleting the messages. If the Ack connection is not assigned, or if the operator chooses not to acknowledge alarms, all messages are deleted immediately.

From the alarm banner

When the operator presses the clear alarm banner button, the displayed alarm is cleared from the banner. The alarm remains in the alarm log file and in all alarm lists it appears in.

Using alarm buttons to sort alarms and reset alarm status

Sorting alarms

When the operator presses the sort alarms button, the sort order toggles from time to trigger value or from trigger value to time. The sort order applies to all alarms in all alarm lists and in the alarm log file.

Resetting alarm status

When the operator presses the reset alarm status button, the alarm status of each alarm is reset as follows:

- The accumulated time an alarm has been in alarm is reset to 0. If the alarm is still active, the time begins accumulating again.
- The number of times the alarm has been triggered is reset to 0. If the alarm is still active, the number changes to 1.

If the Status Reset connection is assigned (in the Alarm Setup editor), it is set to 1 for the hold time or for the duration of the button press, whichever is longer. If a hold time from a previous reset alarm status button press is still in effect, the button press is ignored.

Pressing the clear alarm history button can also reset the status of alarms, if you select the Reset alarm status option for the button. You can set the button up to clear and reset the status of all alarms, or just the alarms for a specific alarm trigger.

Retaining alarm status

The status of alarms is retained when the application is shut down. When the application is restarted:

- if an alarm is still active, the time begins accumulating again.
- if an alarm is still active, the number of times the alarm has been triggered is increased by 1.

Changing the alarm status displayed in the alarm status list

When the operator presses the alarm status mode button, the type of alarms displayed in the alarm status list changes as follows:

- If the current type displayed is all alarms, the list changes to display active alarms only.
- If the current type displayed is active alarms, the list changes to display past alarms only.
- If the current type displayed is past alarms, the list changes to display all alarms.

The change affects the linked or selected alarm status list only, not all alarm status lists.

10 Setting up FactoryTalk Diagnostics

This chapter describes:

- FactoryTalk® Diagnostics.
- displaying diagnostics messages during application development.
- viewing FactoryTalk Diagnostics log files.
- using the Diagnostics Setup tool.
- displaying and printing diagnostics messages at run time.
- the [DIAGNOSTICS] display.
- creating your own diagnostics display.
- opening and closing the diagnostics display.
- how the diagnostics list graphic object works.

About FactoryTalk Diagnostics

FactoryTalk Diagnostics records information about various types of system activity, including:

- macro usage.
- operator comments.
- system messages and errors.
- errors from the communication network.
- tag read and write activity.

Browsing diagnostics messages

You can view diagnostics messages about system activity during application development and at run time. For example, while you develop your application, use diagnostics messages to track what the system is doing and to ensure you've set things up the way you intend. At run time, use diagnostics messages to show the operator messages about system activity. You can also save information in a log file for future processing or analysis.

How to set up FactoryTalk Diagnostics

You must set up FactoryTalk Diagnostics on both the development computer and the run-time computer. The settings for FactoryTalk Diagnostics apply to all Rockwell Automation® products installed on the computer.

Setting up FactoryTalk Diagnostics involves:

- setting up destinations, where logged information is received for storage or display.
- setting up which destinations receive which categories of messages. This is called message routing.
- setting up how messages are displayed and printed at run time.

This chapter describes how to set up FactoryTalk Diagnostics on personal computers. For information about setting up FactoryTalk Diagnostics on the PanelView™ Plus 6, PanelView™ Plus or PanelView™ Plus CE terminal, see the *PanelView Plus Terminals User Manual*.

Destinations

FactoryTalk Diagnostics allows you to send diagnostics messages to multiple destinations.

During application development

During application development, you can send diagnostics messages to:

- the Diagnostics List at the bottom of the FactoryTalk View Studio window.
- a local log, which is viewable using the FactoryTalk Diagnostics Viewer tool.
- an ODBC database.

At run time

At run time, you can send diagnostics messages to:

- diagnostics list graphic objects, either in the default [DIAGNOSTICS] display, or in a display you create.
- a printer
- a local log (available on personal computers only), which is viewable using the FactoryTalk Diagnostics Viewer.
- a remote log (PanelView Plus 6, PanelView Plus or PanelView Plus CE terminals only).
- an ODBC database.

The FactoryTalk Diagnostics Viewer is available on personal computers only. However, if you send diagnostics messages from a PanelView Plus 6, PanelView Plus or PanelView

Plus CE terminal to a personal computer, you can view the messages in the FactoryTalk Diagnostics Viewer.

The destinations available on your computer might vary, depending on which Rockwell Automation products you have installed.

Message routing

You can decide which destinations receive which kinds of messages. This allows you to make the right information available to the right person, in the right place.

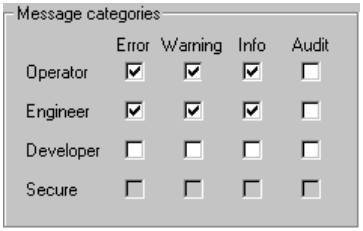
For example:

- You can send messages that contain information about what the system is doing to the local log file. You can also send warnings about things that might go wrong if left unattended to the local log file.

  This allows a control systems engineer to analyze system activity and performance, and make corrections during scheduled maintenance times.
- You can send errors that require immediate action to the diagnostics list object in the [DIAGNOSTICS] display, as well as the log file.
- You can set up the [DIAGNOSTICS] display to open automatically when system activity occurs, to allow the operator to respond to problems that might stop production if they are not solved immediately.

Categories

FactoryTalk Diagnostics categorizes messages by severity, and by audience. For each destination, you can specify the message severity and audience.



Choosing not to log messages

If messages of a particular category are not routed to any destination, the messages for that category are not logged. For example, you might not want to log information messages, or you might not want to send any messages to the Operator.

Message severities

FactoryTalk View categorizes messages in four severities:

- Errors indicate that a process or action has failed. For example, a tag's value could not be written, or a user typed the wrong password while logging on to the system.
- Warnings indicate that a process or action might not function correctly, or might eventually fail if preventive action isn't taken. For example, if an ActiveX® control used in a graphic display is a different version than the one installed on the run-time computer, a warning is logged to indicate the mismatch. Mismatched ActiveX controls might not behave as expected at run time.
- Information indicates that a process or action has completed successfully. For example, a user logged on to the system or a tag value has been written to the data source.
- Audit indicates that the system configuration has been changed. FactoryTalk View records the creation, modification, and deletion of components (such as graphic displays) as audit messages.

  Other Rockwell Automation products also use audit messages. For example, if you set up an audit log in RSMACC, FactoryTalk View's audit messages will be sent there, as well as to FactoryTalk Diagnostics.

In the FactoryTalk Diagnostics Viewer, the message severity is shown in the Severity column, indicated by the ! symbol.

The content of the messages is provided by the system—you don't need to do anything to set up message content.

Audiences

FactoryTalk Diagnostics allows messages to be categorized differently for the various people for whom the messages are relevant. You can sort the messages in the FactoryTalk Diagnostics Viewer, so that those relevant to a particular person are grouped together.

Who receives which messages?

You can specify which types of messages are sent to the Operator, Engineer, and Developer audiences.

FactoryTalk View automatically sends audit messages to the Engineer and Secure audiences. Audit messages allow auditing tools, such as those required for US Government 21CFR Part 11 compliance, to track system activity.

Displaying diagnostics messages during application development

During application development, diagnostics messages are displayed as you create, modify, and delete components, and when you test your graphic displays. The messages are displayed in the Diagnostics List at the bottom of the FactoryTalk View Studio window. You can also view the messages in the FactoryTalk Diagnostics Viewer, as described in the next section.

By default, all warning and error messages are displayed in the Diagnostics List. To change what is displayed in the Diagnostics List, use the Diagnostics Setup tool, as described on page 10-6.

For information about testing graphic displays, see page 19-10.

To display the Diagnostics List

- On the View menu, click Diagnostics List. A check mark beside the menu item indicates the Diagnostics List is displayed.

For information about moving, resizing, and clearing messages in the Diagnostics List, see page 2-5.

If you don't want to display diagnostics messages

- On the View menu, click Diagnostics List. The option is turned off when no check mark appears.

Viewing FactoryTalk Diagnostics log files

Use the FactoryTalk Diagnostics Viewer tool to view the contents of FactoryTalk Diagnostics local log files. You can open the FactoryTalk Diagnostics Viewer from within FactoryTalk View Studio, or from the Windows® Start menu.

The FactoryTalk Diagnostics Viewer is available on personal computers.

You can also set up personal computers to accept messages from PanelView Plus 6. PanelView Plus or PanelView Plus CE terminals, and then display the messages in the FactoryTalk Diagnostics Viewer or in the Diagnostics List. For information about sending messages from PanelView Plus 6, PanelView Plus or PanelView Plus CE terminals to personal computers, see page 10-8.

To open the FactoryTalk Diagnostics Viewer, do one of the following

- In FactoryTalk View Studio, on the Tools menu, click Diagnostics Viewer.
- On the Windows Start menu, select Programs > Rockwell Software > FactoryTalk Tools, and then click Diagnostics Viewer.

For information about setting up FactoryTalk Diagnostics to send messages to the local log, see Help for the Diagnostics Setup tool. For additional information about setting up and using the FactoryTalk Diagnostics Viewer, see the FactoryTalk Diagnostics Viewer Help.

Using the Diagnostics Setup tool

Use the Diagnostics Setup tool to set up:

- destinations and message routing on the development computer, including logging to the local log or to an ODBC database.
- destinations and message routing on personal computers, including run-time logging to the local log or to an ODBC database.
- the Windows CE run-time destination to receive logged messages from.

You can also use the Diagnostics Setup tool to clear the local log file.

To open the FactoryTalk Diagnostics Setup tool, do one of the following

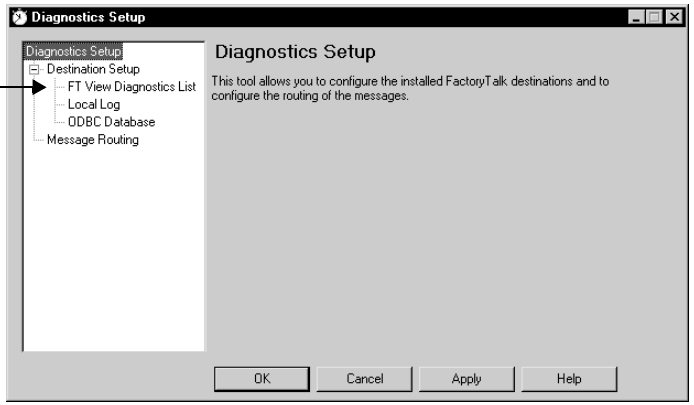
- In FactoryTalk View Studio, on the Tools menu, click Diagnostics Setup.
- In the FactoryTalk View ME Station dialog box, click Terminal Settings, and then double-click Diagnostics Setup.

  For information about opening the FactoryTalk View ME Station dialog box:

  - on personal computers, see page 15-4.
  - on a PanelView Plus 6, PanelView Plus or PanelView Plus CE terminal, see page 16-3.

- On the Windows Start menu, select Programs > Rockwell Software > Utilities, and then click Diagnostics Setup.

Specify which destinations receive what categories of messages.



For details about using the Diagnostics Setup tool, see Help for the tool.

Logging to an ODBC database

The option of logging FactoryTalk Diagnostics messages to an ODBC database is available for personal computers only.

ODBC logging works by periodically exporting the contents of the local log file to an ODBC-compliant database. FactoryTalk View supports these ODBC-compliant databases:

- Microsoft® Access
- Sybase SQL Server
- Oracle
- Microsoft SQL Server

If you have set up FactoryTalk Diagnostics to overwrite events in the local log file, make sure messages are logged to the ODBC-compliant database before the oldest events are deleted.

For information about the contents of the FactoryTalk Diagnostics ODBC tables, see Appendix D.

Setting up message buffering

FactoryTalk Diagnostics messages are stored in the computer's local log file, and are exported to the ODBC-compliant database at the interval you specify.

You can also specify that messages remain in the local log file for a period of time after they have been exported to the ODBC-compliant database. This is useful in the event of a network failure, or any other reason that causes the database to be unavailable. In this case, the messages remain in the local log file until the buffer time expires. If the ODBC-compliant database becomes available during that time, the buffered messages are then exported to the database.

Routing messages

For each destination you set up, you can specify how messages are routed.

To route messages, specify:

- the types of messages to log.
- the audiences to send the messages to.
- whether to accept messages from Windows CE devices.

For information about who receives which types of messages, see page 10-4.

Receiving messages from a PanelView Plus 6, PanelView Plus or PanelView Plus CE terminal

You can set up FactoryTalk Diagnostics to receive messages that are generated on the PanelView Plus 6, PanelView Plus or PanelView Plus CE terminal at run time. The terminal must be on the same network as the computer running FactoryTalk Diagnostics.

To receive messages:

- enable the personal computer to receive the messages. For details see Help for the Diagnostics Setup tool.
- set up the PanelView Plus 6, PanelView Plus or PanelView Plus CE terminal to send the messages.

For information about setting up a PanelView Plus 6, PanelView Plus or PanelView Plus CE terminal to log to the personal computer, see the *PanelView Plus Terminals User Manual*.

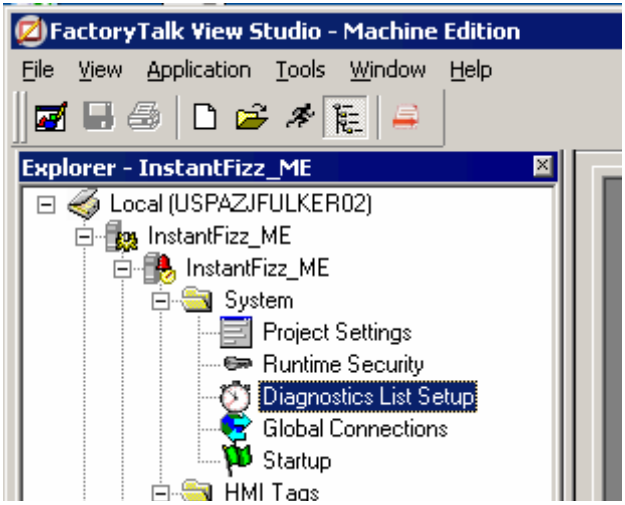
Displaying and printing diagnostics messages at run time

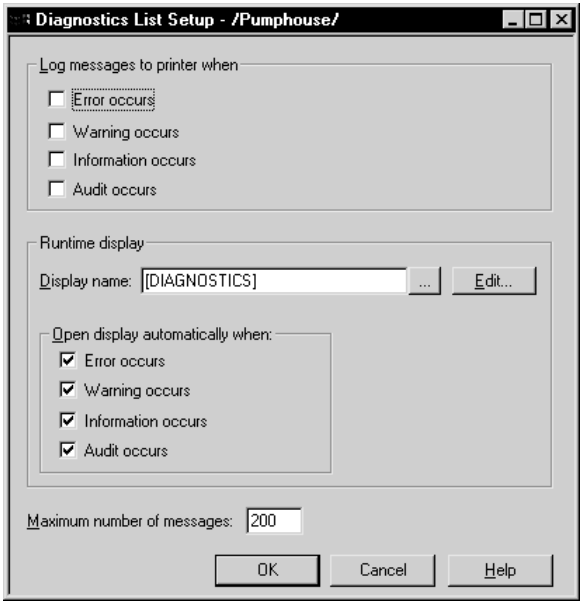
At run time, you can display diagnostics messages in a graphic display. You can also print the messages.

Using the Diagnostics List Setup editor

Use the Diagnostics List Setup editor to set up when to print and display messages at run time in FactoryTalk View ME Station.

The Diagnostics List Setup editor is located on the application tree under the System folder. Double-click on Diagnostics List Setup to open the editor.





For details about using the Diagnostics List Setup editor, see Help.

Printed messages list the date and time, the category of system activity, and the message text. By default, messages are not printed at run time.

By default, your application is set up to display diagnostics messages automatically at run time. If you want to use the default settings, you don't need to do anything further to set up diagnostics messages for print and display in FactoryTalk View ME Station.

The messages that are printed and displayed depend on how you set up FactoryTalk Diagnostics on the run-time computer:

- For applications running on personal computers, use the Diagnostics Setup tool to set up diagnostics message logging. For information about using the Diagnostics Setup tool, see Help.
- For information about setting up FactoryTalk Diagnostics on the PanelView Plus 6, PanelView Plus or PanelView Plus CE terminal, see the *PanelView Plus Terminals User Manual*.

For applications running on personal computers, you can also view the run-time messages in the FactoryTalk Diagnostics Viewer, as described on page 10-5.

If you don't want to display diagnostics messages in FactoryTalk View ME Station

- In FactoryTalk View Studio, in the Diagnostics List Setup editor, clear the Display name box, or clear the four "Open display automatically when" boxes.

Setting up how messages are displayed and printed at run time

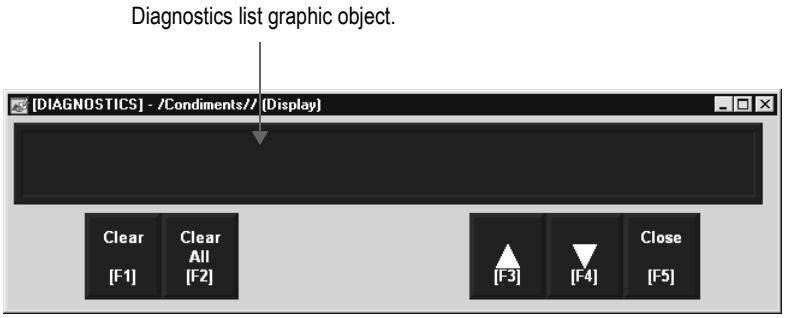
Follow these steps to set up how diagnostics messages are displayed at run time:

1. In FactoryTalk View Studio, in the Diagnostics List Setup editor, specify which messages to print, the graphic display to use, when to open the graphic display, and the maximum number of messages to store.
2. If desired, modify the default [DIAGNOSTICS] display, or create your own graphic display to use for diagnostics messages. For example, if you don't want the operator to clear all messages at once, edit the default display to remove the clear all button.

   For information about graphic displays, see Chapter 19.

The [DIAGNOSTICS] display

When you create an application, it comes with a graphic display called [DIAGNOSTICS]. The [DIAGNOSTICS] display is the default display for showing diagnostics messages at run time.



You can use the [DIAGNOSTICS] display as is, or modify the display. For example, you can change the color of the objects, or add and remove buttons. Or, you can create your own graphic display to use for displaying diagnostics messages. In the Diagnostics List Setup editor, specify the display to use.

The diagnostics list graphic object

The [DIAGNOSTICS] display contains a diagnostics list graphic object, which lists the diagnostics messages. For more information about the diagnostics list, see page 10-12.

Buttons in the [DIAGNOSTICS] display

The [DIAGNOSTICS] display contains diagnostics list buttons for clearing the messages, as well as buttons for scrolling the list and closing the display. For information about how the buttons work, see page 10-13.

Creating your own diagnostics display

You can create your own graphic display for displaying diagnostics messages, containing a diagnostics list graphic object and the buttons the operator needs for using the display.

If you create your own graphic display, use an On Top display and select the Cannot Be Replaced option.

For more information about the diagnostics list, see page 10-12. For information about the buttons you can use with the list, see page 10-13. For information about creating graphic displays and graphic objects, see Chapter 19 and Chapter 20.

Opening and closing the diagnostics display

Opening the display

The diagnostics display you specify in the Diagnostics List Setup editor (either the default [DIAGNOSTICS] display or a display you create) is automatically opened whenever a diagnostics message of the specified severity occurs.

The display remains open until the operator closes the display.

If you decide not to open the diagnostics display automatically, you can create a goto display button that the operator can press to open the diagnostics display. For information about setting up a goto display button and specifying the display to open, see Help.

Closing the display

The operator can close the display by pressing a close display button.

How the diagnostics list graphic object works

At run time, when a severity of system activity occurs that you've set up to log, a message about the activity is added to the diagnostics list. The diagnostics list can be in the [DIAGNOSTICS] display, in a diagnostics display you have created, or can be placed on any display in your application.

You can use multiple diagnostics lists, in the same display or in different displays. Each diagnostics list displays the same information.

For information about setting up diagnostics lists, see Help.

What is displayed

- If the message is too long to fit in the list, the last displayed character is replaced with an asterisk (*).
- The number of diagnostics messages that is visible at one time depends on the height of the diagnostics list and the list's font size.
- Messages are listed with the newest diagnostics message on top.

Using buttons with the diagnostics list

Diagnostics buttons

You can use these diagnostics buttons to interact with the diagnostics list:

This button	Does this
Diagnostics clear	Clears the selected message from all diagnostics lists in the application.
Diagnostics clear all	Clears all diagnostics messages from all diagnostics lists in the application.

You can assign any captions you choose to the labels on the diagnostics buttons.

You can link the diagnostics clear button to a specific diagnostics list. When the operator presses the button, the selected message is deleted from the linked diagnostics list, and also from any other diagnostics lists in the application. For information about linking buttons to objects, see page 21-9.

Key buttons

You can also use these key button graphic objects to interact with the diagnostics list:

This button	Does this
Move up	Scrolls up one row in the list.
Move down	Scrolls down one row in the list.
Page up	Moves the highlight up one page in the list.
Page down	Moves the highlight down one page in the list.
Home	Moves the highlight to the top message in the list.
End	Moves the highlight to the bottom message in the list.

You can set up the key buttons to work only with the specified diagnostics list, or to work with whichever object is selected in the graphic display. For information about linking buttons to objects, see page 21-9.

For information about creating graphic objects, see Chapter 20. For information about setting up specific buttons, see Help.

11 Setting up security

This chapter describes:

- using FactoryTalk Security™.
- steps for setting up security without FactoryTalk Security.
- using the Runtime Security editor.
- how user accounts and security codes work.
- assigning security to graphic displays.
- providing a way for users to log in and log out.
- preventing unauthorized users from stopping the application.
- setting up FactoryTalk Security in FactoryTalk® View Studio, including:
  - adding FactoryTalk Security user groups and users, and setting up passwords.
  - assigning user access to the computer's FactoryTalk Directory. FactoryTalk View Machine Edition uses the local FactoryTalk Directory.
  - setting up security access to the application, action groups, policies, networks and devices, user groups, users, and other resources.
  - setting up policies for passwords and user accounts, for backing up and restoring FactoryTalk Directory, and for tracking activities for audit purposes.
- a sample startup display that uses all the FactoryTalk View security features.

Using security with your application

FactoryTalk Security works together with FactoryTalk View security features to provide secure access to applications during development and at run time. FactoryTalk Security is installed as part of the FactoryTalk Services Platform, and uses FactoryTalk Directory to manage user accounts and policies.

FactoryTalk Security applies to all applications and all Rockwell Automation® products installed on the development or run-time computer. For example, when you add a FactoryTalk Security user, the user is then available to add to any FactoryTalk View application.

You can use FactoryTalk Security features on the development computer to:

- determine which users can view, edit, create, and delete applications.
- determine which users can manage users and set up security.

- determine which users can back up and restore applications.

You can use a combination of FactoryTalk Security and FactoryTalk View security features at run time to:

- prevent unauthorized users from running the application.
- prevent users from opening graphic displays.
- prevent unauthorized users from stopping the application.
- prevent users from seeing and using certain parts of a graphic display.
- prevent users from switching to other applications. This feature uses the DeskLock tool, and is available for personal computers only. You can use this tool to set up a customized desktop and to prevent access to Windows® functions. For more information about the DeskLock tool, see Chapter 15. The DeskLock tool does not use FactoryTalk Security.

To limit the users who have access to the application or parts of the application, you must set up user accounts and passwords.

If you set up the data source to open graphic displays remotely (using global connections), remote display changes occur whether or not the logged-in user has security access to a given display.

For details about controlling display changes remotely, see page 8-4.

If you do not want to use FactoryTalk Security

If you do not plan to use security for your application, you can eliminate or minimize the use of FactoryTalk Security.

During installation, users are set up as follows:

- an administrative user named Administrator is created.
- all users are granted initial access permissions.
- a Windows-linked user group named Authenticated Users is created and added to the User Groups folder in the FactoryTalk Directory.

This means that any user who is authenticated by Windows—that is, has a password that allows access to the development computer—can open FactoryTalk View Studio without providing a user name or password.

Authenticated users are not supported on Windows CE. On Windows CE terminals, Windows-linked users must be added to FactoryTalk Directory before they can be logged in.

If you do not use FactoryTalk View user accounts

FactoryTalk View creates a user named DEFAULT, and this user is automatically logged in when you start applications at run time. You do not need to set up any other users, and users do not need to log in to use the applications you create.

If you use FactoryTalk View user accounts

If you want to use FactoryTalk View user accounts, for example, to run login and logout macros, but you do not want to use FactoryTalk Security, follow these steps.

1. Add users or user groups to FactoryTalk Security. For details, see page 11-17.
2. Add the FactoryTalk Security users or user groups to the FactoryTalk View Runtime Security editor. For details, see page 11-5.
3. In the FactoryTalk View Runtime Security editor, if desired, assign login and logout macros and security codes to users or user groups. For details, see Help for the editor.
4. In the Graphics editor, assign security codes to graphic displays that will have limited access.
5. Provide users with a method for logging in and out.
6. If desired, prevent unauthorized users from stopping the application.

These steps are described in detail in this chapter.

Working with the Runtime Security editor

Use the Runtime Security editor to:

- add FactoryTalk Security users and assign security codes and login and logout macros, for each user or group of users that will have access to the application at run time.
- migrate users from RSView® 3.20 and earlier to FactoryTalk View version 4.00 or later.
- assign user passwords (version 3.20 and earlier applications only).
- add Windows users or groups (version 3.20 and earlier applications only).

The method for adding users and assigning security codes to them depends on whether you are setting up users for FactoryTalk View 4.00 applications, or for RSView 3.20 and earlier applications. There is a separate tab for 4.00 and later applications and for 3.20 and earlier applications.

The Runtime Security editor has special items on the View menu to control the appearance of the editor. It also has items on the Setup menu, and extra tools on the toolbar.

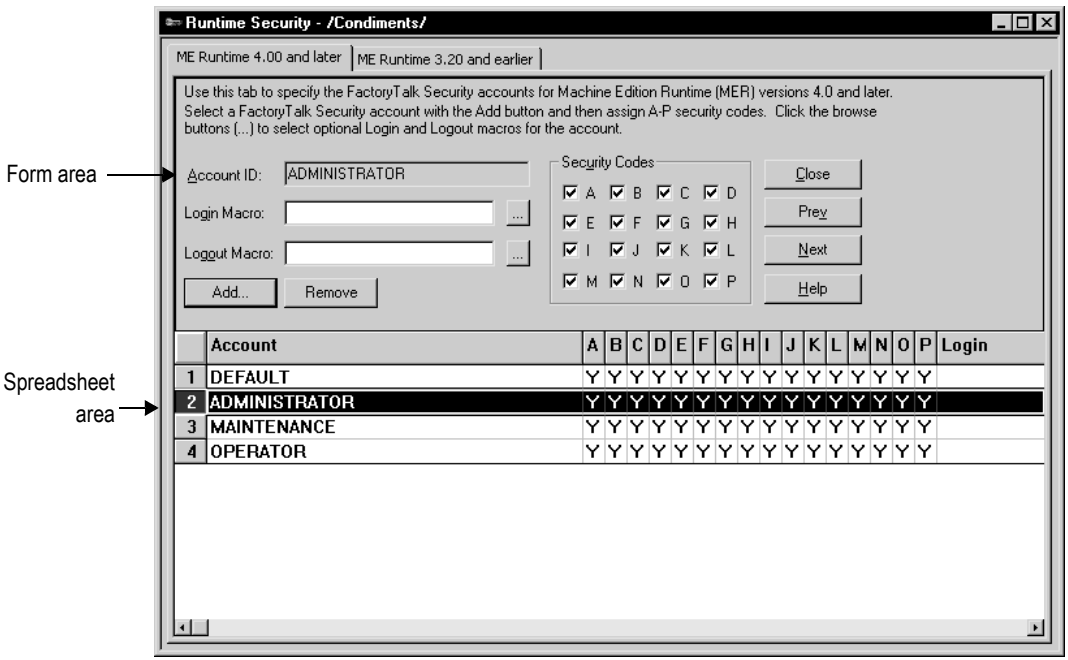
The DEFAULT user

The first account in the editor is the DEFAULT user account. The DEFAULT account is used when no one is logged in. The DEFAULT user initially has access to each security code. Unless you want everyone to have access to all parts of the application at run time without logging in, turn off the DEFAULT user's access to the security codes you plan to use.

You cannot delete the DEFAULT user account.

Assign the security code for the startup display to the DEFAULT user, or else the startup display won't open. If the startup display uses the * security code, you can assign any code from A to P to open the display. For more information, see page 11-9.

Setting up users for 4.00 and later applications


Runtime Security - /Condiments/
ME Runtime 4.00 and later
ME Runtime 3.20 and earlier
Use this tab to specify the FactoryTalk Security accounts for Machine Edition Runtime (MER) versions 4.0 and later.
Select a FactoryTalk Security account with the Add button and then assign A-P security codes. Click the browse buttons (...) to select optional Login and Logout macros for the account.
Account ID:
ADMINISTRATOR
Login Macro:
Logout Macro:
Add...
Remove
Security Codes
A B C D
E F G H
I J K L
M N O P
Close
Prev
Next
Help
Account
A B C D E F G H I J K L M N O P Login
1 DEFAULT
2 ADMINISTRATOR
3 MAINTENANCE
4 OPERATOR
Form area
Spreadsheet area

Use the form area to assign macros and security codes to users.

To add FactoryTalk Security users and groups to FactoryTalk View and assign security codes to them

1. Open the Runtime Security editor and select the ME Runtime 4.00 and later tab.
2. Click Add.

3. In the Select User or Group dialog box, add users and groups, and select the ones to add to FactoryTalk View. You can only select one user or group at a time.

   For details on using the Select User or Group dialog box, see Help.

4. In the Runtime Security editor, assign login and logout macros and security codes to the users and groups.

   For details about using the Runtime Security editor, see Help.

To migrate RSView 3.20 and earlier users to FactoryTalk View

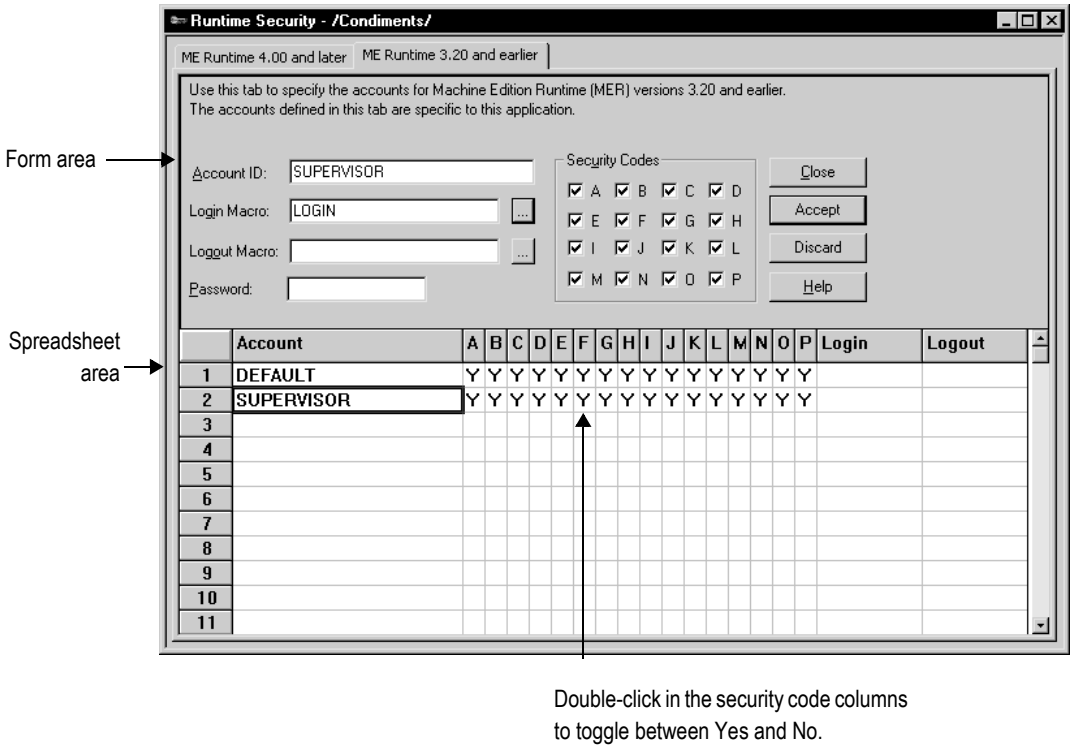
1. With the Runtime Security editor open and the ME Runtime 4.00 and later tab selected, on the Setup menu, click Migrate ME Runtime 3.20 and earlier accounts.

   Users from the ME Runtime 3.20 and earlier tab are added to the FactoryTalk Security Users folder and to the ME Runtime 4.00 and later tab.

   Users are not migrated if they already exist in the ME Runtime 4.00 and later account list.

2. If desired, edit the users' security codes and login and logout macros.
3. To edit the users' passwords, see page 11-18.

Setting up users for 3.20 and earlier applications



To add users to RSView 3.20 and earlier applications and assign security codes to them

1. Open the Runtime Security editor and click the RSView 3.20 and earlier tab.
2. Add users, and then assign macros, passwords, and security codes to them.

   For details about using the Runtime Security editor, see Help.

Changing RSView 3.20 and earlier user passwords

For RSView 3.20 and earlier applications, users cannot change passwords at run time. You can only change passwords in the Runtime Security editor. After changing passwords, recreate the application and download the .mer file.

Adding 3.20 and earlier users or groups from a Windows domain

In RSView 3.20 and earlier applications, there are two possible types of user accounts:

- users or groups from a Windows domain
- users you create in FactoryTalk View.

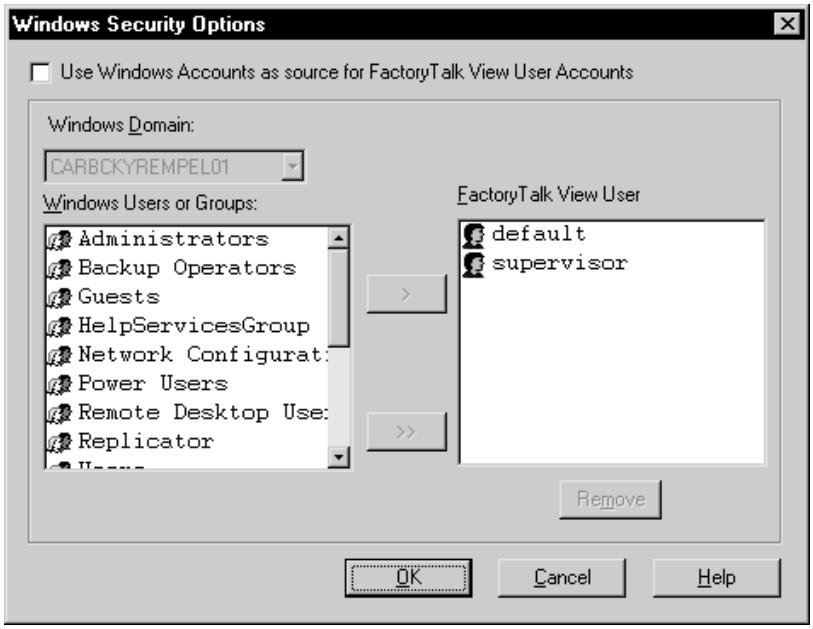
You cannot use both user account types in the application at the same time.

Before you can make use of Windows user accounts in FactoryTalk View, you must first create the user accounts in your Windows domain. To do this in a Windows network domain, your network must have at least one Windows server acting as a domain controller. You cannot use Windows Workgroups.

When you use Windows users or groups, the user password is the Windows domain password.

To add users from a Windows domain to FactoryTalk View

1. Open the Runtime Security editor, and then click the RSView 3.20 and earlier tab.
2. On the Setup menu, click Windows Security Options.



3. In the Windows Security Options dialog box, specify the users and groups to use. For details, see Help.
4. In the Runtime Security editor, specify login and logout macros and assign security codes to the users. For details, see Help.

   You cannot change the user or group name (Account ID) and password. To change the password, use the Windows Control Panel.

Removing 3.20 and earlier users or groups

You can also use the Windows Security Options dialog box to remove users or groups. When you remove a user or group from the FactoryTalk View User list, the user or group's name is deleted from the FactoryTalk View Runtime Security editor. The user or group is not deleted from the Windows domain.

If you remove users from the Windows domain, they are not removed automatically from the FactoryTalk View Runtime Security editor. You must remove the users from the Runtime Security editor manually, using the Windows Security Options dialog box.

How user accounts and security codes work

When you assign a security code to a graphic display, only the users and groups who are assigned that security code have access to the display. There are 16 security codes, A through P.

The asterisk symbol (*) is used in displays and represents any code. Users must have at least one code assigned to open displays that use the * code.

You can assign combinations of security codes to users and groups, to allow each user or group access to a different set of displays or graphic objects.

To use security codes to restrict user access to graphic objects, assign visibility animation to the objects using expressions containing the security functions. For an example, see page 11-11.

Assigning security to graphic displays

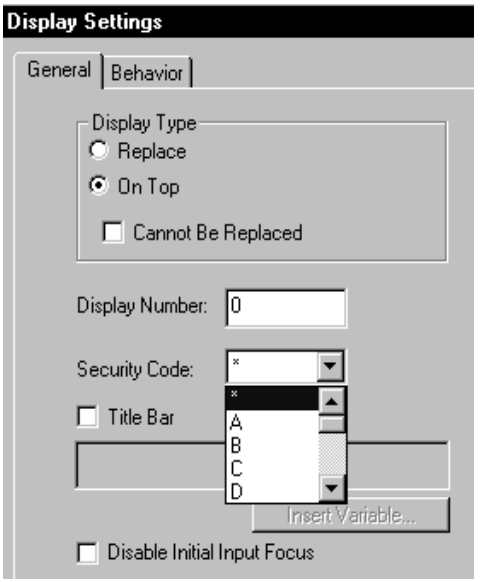
Assign security to graphic displays in the Graphics editor. You can:

- assign security when you create the graphic display, or at any time after creating the display.
- assign the same security code to more than one display.
- assign whichever codes you want, in any order. For example, you can choose to use only the codes D and P and you can assign P before you assign D.

For more information about graphic displays, see Chapter 19.

To assign security to a graphic display

1. In the Graphics editor, right-click an empty area of the display, and then click Display Settings.



2. In the General tab, select a security code.

   To give every security code access to the display, select the asterisk (*). The * is selected by default.

Example: Assigning security codes to prevent access to graphic displays

This example shows how to set up users with access to different graphic displays.

1. Assign security codes to graphic displays as follows:

To this display	Assign this security code
Alarm History	A
Boiler	B
Furnace	C
Top Secret	D

2. In the Runtime Security editor, assign the security code P to the DEFAULT user.
3. Assign security codes for the displays they can use to the other users:

To this user	Assign these security codes
MAINTENANCE	A, B, C
OPERATOR	A, B
ADMIN	All

The users have access to these graphic displays:

- MAINTENANCE has access to the first three graphic displays.
- OPERATOR has access to the Alarm History and Boiler displays, but not to the Furnace or Top Secret displays.
- The ADMIN user has access to every graphic display.
- The DEFAULT user has access only to graphic displays to which * or P has been assigned. In this example, the DEFAULT user does not have access to any of the four graphic displays.

In this example, you could have assigned the same security code to the Alarm History and Boiler displays, since all users except the DEFAULT user have access to these displays.

Example: Using security codes to control the visibility of the shutdown button

This example shows how to set up users so that only authorized users can use the shutdown button to stop the application.

This example uses the CurrentUserHasCode security function to determine whether a user is authorized to view and use the shutdown button.

The security code E is assigned to users who are authorized to use the button.

1. In the Runtime Security editor, clear all the security codes for the DEFAULT user.

2. Assign security codes to the other users:

To this user	Assign these security codes
OPERATOR	A, B
MAINTENANCE	A, B, C, E
ADMIN	All

3. Create a shutdown button.
4. Assign visibility animation to the button using this expression:

   CurrentUserHasCode(E)

   For the Expression True State, click Visible.

When the graphic display containing the shutdown button is open, the MAINTENANCE and ADMIN user can see the button. If the OPERATOR or DEFAULT user is logged in, the button is not visible.

Providing a way for users to log in and log out

Use login and logout buttons to provide a way for users to log in and log out. Make sure you place these buttons in graphic displays that all users have access to.

Logging in

When the application starts, the DEFAULT user is logged in. If a macro is assigned to the DEFAULT user, the macro runs.

For example, you could create a macro to set the remote display number to open a new login display after the DEFAULT user logs in. For information about controlling display changes remotely, see page 8-4. Remote display changes are not checked for security.

To provide a way for users to log in

1. Specify the startup display in the Startup editor, in the Initial graphic box. The startup display is the graphic display that opens when your application starts running.

   The startup display must have the * code or a security code that is assigned to the DEFAULT user, or it will not open.

   For information about the Startup editor, see Chapter 14.

2. Create a login button in the startup display.

   For information about creating graphic objects, see Chapter 20. For information about setting up login buttons, see Help.

For more information about logging in, see Chapter 17.

Logging out

To best maintain your security system, set up your application so that users who log in are also required to log out.

When the current user logs out, if a logout macro is assigned to the user, the macro runs. If the user belongs to a group, and a logout macro is set up for the group, the group's logout macro runs.

After the current user is logged out, the DEFAULT user is logged in. If a login macro is assigned to the DEFAULT user, the macro runs. Turn off the DEFAULT user's access to the security codes you plan to use.

To provide a way for users to log out

- Create a logout button in a graphic display that all logged-in users have access to.

Logging out automatically

You can set up your run-time terminal so that the current user will be logged out automatically after the terminal has been inactive for a specified period of time. The automatic logout is independent of FactoryTalk Security settings or Windows security settings. The logout will take place regardless of what you set up in FactoryTalk Security or Windows.

To set up automatic logout

1. In the Explorer window, double-click Project Settings, and then click the Runtime tab.
2. Select Enable auto logout.
3. Specify how many minutes the terminal must be inactive before the automatic logout occurs.
4. If desired, specify a graphic display to open after the automatic logout.

At run time, when the inactivity period expires, the current user is logged out. Logout macros assigned to the current user run. The DEFAULT user is logged in. The DEFAULT user's login macro runs. The specified graphic display opens (if any).

Preventing unauthorized users from stopping the application

To prevent unauthorized users from stopping the application

- Do not use a title bar on the application window, because the title bar contains a Close button. To turn off the title bar for the application window, in the Project Settings editor, in the Runtime tab, clear the Title bar check box.

  For more information about using the Project Settings editor, see Chapter 4.

- Assign visibility animation to the shutdown button, so that the button is only visible when a user who is authorized to stop the application is logged in. For an example, see page 11-11.

  Or, set up security for the graphic display in which the shutdown button is located, so only users who are authorized to stop the application can open the display.

Additional step for personal computers

- Use the DeskLock tool to prevent users from having access to the Windows desktop. This will prevent access to operating system functions such as restarting Windows or shutting down tasks. For more information, see page 15-17.

Additional step for PanelView Plus CE applications

- Hide the Windows Taskbar to make it inaccessible.

To hide the Windows Taskbar

1. On the Windows Start menu select Settings, and then select Taskbar.
2. Clear the "Always on top" check box.
3. Select Auto hide.
4. When you are finished, click OK.
5. At the Command prompt or in the Run box, run Regflush.exe to save your changes to persistent internal flash memory. Otherwise, the changes will be lost when you reboot.

Setting up FactoryTalk Security for your application

In the Explorer window of FactoryTalk View Studio you can:

- create FactoryTalk Security users and groups of users, and assign passwords to users.
- set up access to the FactoryTalk Directory.
- set up access to the application.
- assign security access to action groups, policies, groups, and users.
- set up access to network devices, connections, and databases.
- specify which users can backup and restore FactoryTalk Directory.
- specify the types of activities to track for audit purposes.
- specify policies for passwords and user accounts, such as how often passwords must be changed.

Depending on what other products are installed on the computer, you can also assign security access for those products to your users. For example, you can specify which users are allowed to browse the network for RSLinx® Enterprise™ devices.

Set up access to the FactoryTalk Directory.

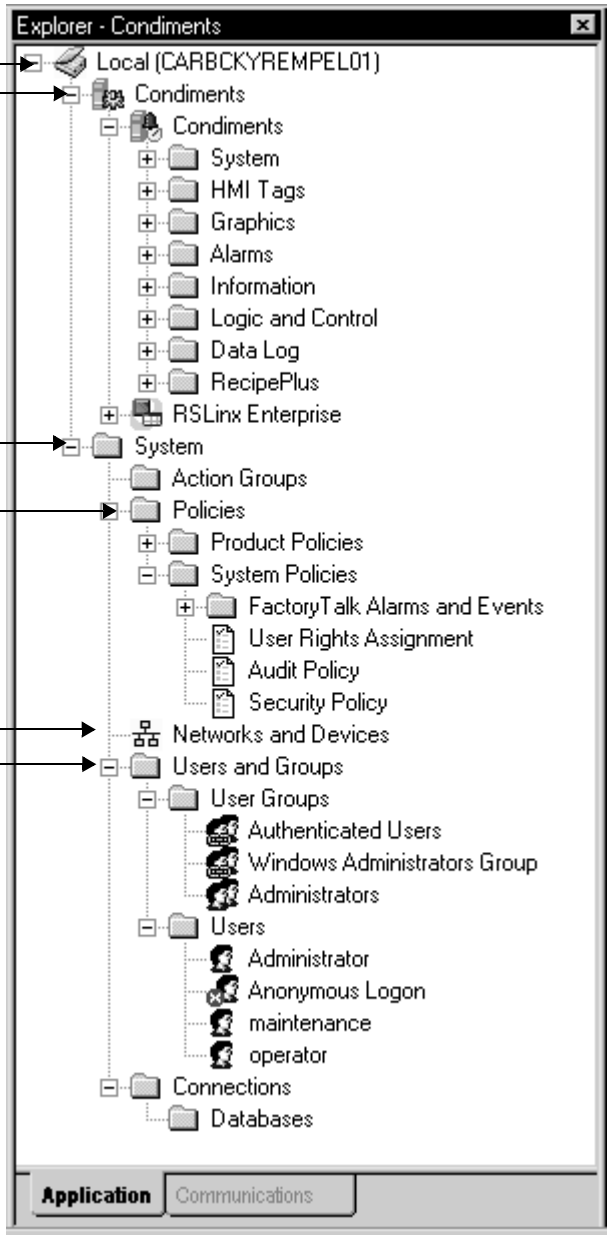
Set up access to the application.

You can assign security to all the folders in the System folder.

Set up policies.

Set up access to devices.

Add users and groups, and assign passwords. The link symbol indicates Windows-linked groups and users.



Summary of steps

Follow these steps to set up security using FactoryTalk Security and FactoryTalk View security features:

1. In the Explorer window, in the System folder underneath the HMI server, add FactoryTalk Security user groups and users, and set up their passwords.

   You can also add users and groups in the Runtime Security editor, in the ME Runtime 4.00 and later tab, as described on page 11-5.

2. Assign user access to the computer's FactoryTalk Directory.
3. If desired, restrict access to the application and to networks and devices. You can also restrict security access to policies, user groups, and users.
4. Set up policies for:
   - backing up and restoring FactoryTalk Directory.
   - tracking activities for audit purposes.
   - passwords and user accounts.
5. In the Runtime Security editor, add FactoryTalk Security users or user groups to FactoryTalk View, and assign login and logout macros and security codes to them.
6. In the Graphics editor, assign security codes to graphic displays that will have limited access.
7. Provide users with a method for logging in and out.
8. If desired, prevent unauthorized users from stopping the application.

These steps are described in detail in the following sections.

You can also assign security to action groups, connections, and databases. These topics are not discussed in this chapter. For information about these topics, see the FactoryTalk Security help.

Creating FactoryTalk Security users

You can set up users in FactoryTalk Security before you add them to the FactoryTalk View Runtime Security editor.

FactoryTalk Security allows you to reference user accounts that have already been set up in Windows. These are called Windows-linked users. The link symbol in the Explorer window indicates that a user is a Windows-linked user.

The FactoryTalk Security access you give to users determines what actions they can perform in FactoryTalk View, both on the development computer and at run time.

To do this	Allow these Common actions
Open applications	Read and List Children
Add and edit applications or components	Write and Create Children
Delete applications or components	Delete
Assign security and create users	Create Children and Configure Security

You can assign different permissions to users at different levels of the application.

Inheriting permissions

The security you set up at the top level, the FactoryTalk Directory, is inherited by the application and users below it, unless you select "Do not inherit permissions." One way to set up security is to assign the Read and List Children permissions to the All Users group at the FactoryTalk Directory level, and then assign permissions for writing, creating children, configuring security, and deleting to users and groups at the application level.

If you deny permission for an action to a user, this overrides permission the user is granted as a member of a group. If you deny permission for an action to a group, allowing the action to a member of the group does not override the denial. The denial always takes precedence.

To set up users

1. In the System folder, right-click Users, and then click New User or New Windows-Linked User.
2. Specify the user name, password, and password options. For details, see Help.
3. Right-click Users, and then click Security.
4. Specify what actions the users can perform. For details, see Help.
5. To add users to a group, right-click the group and then click Properties. For details, see Help.

To change user passwords

1. In the Users folder, right-click the user name, and then click Properties.
2. Click Reset Password. For details, see Help.

Users can change their password at run time using the Password button. For more information, see page 17-4.

Creating FactoryTalk Security user groups

The use of user groups is optional but recommended. Groups allow you to set up security access once for the entire group, rather than individually for members of the group. You can still set up separate permissions for individual members of the group.

Setting up groups saves time. You can add all the users of an application to a single group in FactoryTalk Security, then add the group to the FactoryTalk View Runtime Security editor in one step, which is much quicker than adding the users one by one.

FactoryTalk Security allows you to use groups that have already been set up in Windows. These are called Windows-linked groups. The link symbol in the Explorer window indicates that a group is a Windows-linked group.

FactoryTalk Security comes with an Administrators group already set up. To start with, members of this group have full security access to FactoryTalk Security, and therefore have full access to your applications. The user you set up for FactoryTalk Local Directory when you installed FactoryTalk Services Platform is a member of the Administrators group.

To ensure that you are never locked out of FactoryTalk Directory we recommend that you assign more than one user to the Administrators group. That way if one user is locked out, you can use the other one to log in.

To set up user groups

1. In the System folder, right-click User Groups, and then click New User Group or New Windows-Linked User Group.
2. Add user groups. You can add members to the groups now or later. For details, see Help.
3. Right-click User Groups, and then click Security.
4. Specify what actions members of the group can perform. For details, see Help.
5. To add members to the group later, right-click the group and then click Properties. For details, see Help.

Setting up security access to the FactoryTalk Directory

The FactoryTalk Security access that you set up for the FactoryTalk Directory applies to all FactoryTalk View applications and all Rockwell Automation products installed on the development computer.

By default, applications and the System folder inherit the security permissions assigned to the FactoryTalk Directory. This means that you only need to assign permissions to user groups or users once. If desired, you can override the permissions that you set up at this

level by assigning different permissions to applications and to the items in the System folder.

You can assign permissions for actions related to FactoryTalk View applications and tags here or at the application level. If you assign them here, they are inherited by all applications.

To set security permissions for the FactoryTalk Directory

1. At the top of the tree in the Explorer window, right-click Local, and then click Security.
2. Specify which users and groups have access to FactoryTalk Directory, and assign permissions to users and groups for the actions listed in the dialog box. For details, see Help.

Setting up security access to the application

Assign FactoryTalk Security at the application level to specify which users or groups can open the application and add, edit, and delete components. You can also specify which users or groups can write to tags and set up, view, and respond to alarms.

To set security permissions for the application

1. Right-click the application name, and then click Security.
2. Specify which users and groups have access to the application, and assign permissions to users and groups for the actions listed in the dialog box. For details, see Help.

Setting up security access to System policies, groups, and users

You can assign security access to the System folder and to all the folders in the System folder, including policies, groups, and users. You do this by specifying which groups and users have access to the folder, and what actions they can perform.

To set up security access to policies, groups, and users

1. Right-click the System folder, or a folder in the System folder, and then click Security.
2. Specify which groups and users have access to the folder, and what actions they can perform. For details, see Help.

Setting up security access to networks and devices

You can assign security access to networks and devices in general, to the development computer, and to specific devices. Set up security for networks and devices if you are using RSLinx® Classic™ devices.

To set up security access to networks and devices

1. In the System folder, right-click Networks and Devices, the development computer workstation, or a specific device, and then click Security.
2. Specify which groups and users have access to the item, and what actions they can perform. For details, see Help.

Specifying which users can back up and restore FactoryTalk Directory and FactoryTalk View applications

You can allow users or groups of users to back up and restore the contents of the local FactoryTalk Directory, including applications, users, groups, and all security settings.

Users must have permission to back up and restore FactoryTalk Directory to use the Application Manager tool to back up and restore applications. For information about using the Application Manager, see page 4-10.

To specify which users can back up and restore FactoryTalk Directory and FactoryTalk View applications

1. In the System Policies folder, double-click User Rights Assignment.
2. Set permissions for users. For details, see Help.

Specifying activities to track for audit purposes

You can keep an audit trail of activities such as changing the setup of the FactoryTalk Directory and whether security access is denied or granted to users.

To specify which activities to track for audit purposes

1. In the System Policies folder, double-click Audit Policy.
2. Set up audit policies. For details, see Help.

Specifying policies for passwords, accounts, and FactoryTalk sign-on

You can use the FactoryTalk Directory Security Policy to specify how to manage passwords and user accounts, including how long passwords must be, how often they must be changed (if ever), and whether to keep a record of deleted user accounts.

Remember that any changes that you make to system security policies will be included as part of the run-time application. It is therefore very strongly recommended that you do not alter the default settings in the Security Policy Properties dialog box unless absolutely necessary, and unless you are aware of the full implications of the changes. Always test the run-time application to make sure the results are what you intended.

Single sign-on

You can also use the Security Policy to turn off FactoryTalk single sign-on. If you turn this feature off, users must log into FactoryTalk each time is FactoryTalk View Studio restarted. When the feature is on, if you shut down FactoryTalk View Studio and restart it without restarting your computer, you remain logged in to FactoryTalk and are not prompted to log in again.

To specify how to manage passwords, user accounts, and FactoryTalk sign-on

1. In the System Policies folder, double-click Security Policy.
2. Set up options for accounts, passwords, and single sign-on. For details, see Help.

Summary of security features in a sample startup display

This section provides an example of how to use FactoryTalk Security and FactoryTalk View security features in a startup graphic display called Log In.

To create a startup display that uses security

1. Set up FactoryTalk Security user accounts and passwords.
2. Assign Common\Read and Common\List Children security permissions to all users that are allowed to run the application, at the FactoryTalk Directory or application level.
3. Assign Tag\Write Value permission to all users that are allowed to write values to tags.
4. In the Runtime Security editor, assign at least one security code to each user who you want to log in, including the DEFAULT user.
5. In the Project Settings editor, clear the Title bar check box.
6. Create a graphic display called Main Menu. In the display create navigation buttons that give the operator access to the different displays in the application. Assign a security code to the display so that only authorized users can open it.
7. Create a graphic display called Log In containing these button objects:

This button	Does this
Login	Opens the Login dialog box.
Logout	Logs the current user out and logs in the DEFAULT user.
Password	Opens the Change Password dialog box so the user can specify a new password.

This button	Does this
Goto display	Opens the Main Menu graphic display.
Shutdown	Shuts down the application.

8. Set up the goto display button in the Log In display to open the Main Menu display. If desired, attach visibility animation to the goto display button, so that only logged-in users can see the button.

   For more information, see the example on page 11-24.

9. Attach visibility animation to the shutdown button, so that only authorized users can see (and therefore use) the button.

   For more information, see the example on page 11-24.

10. Specify captions for the buttons, and add explanatory text to the graphic display. If desired, attach visibility animation to the text as well.
11. In the Display Settings dialog box, assign the security code * to the Log In display.
12. In the Startup editor, in the Initial graphic box, select the Log In display.

Until an authorized user is logged in, further access to the application is denied. In addition, only authorized users can stop the application.

Users who have access to the application can use the application and log out. Make sure you provide a way for users to navigate back to the Log In display to log out.

When a user logs out, the DEFAULT user is automatically logged in. Do not give the DEFAULT user access to the goto display button or shutdown button.

You can also use the Remote Display Number connection to open the startup Log In display when a user logs out. This might be useful if users can log out from various locations (graphic displays) within the application. If you use the auto logout feature, you can specify that the Log In display is opened when an auto logout occurs.

For more information about	See
Using the Project Settings editor	Chapter 4
Attaching animation to graphic objects	Chapter 22
Setting up display navigation	Chapter 13
Using the Startup editor	Chapter 14
Logging in, logging out, and changing passwords	Chapter 17

For more information about	See
Stopping applications	Chapter 15

Example: Assigning visibility animation to the goto display button

This example shows how to assign visibility animation to the goto display button so that a user must log in before seeing the button.

This example uses the security function CurrentUserName( ). The function returns the string value of the Account ID (user name) for the user who is currently logged in.

The CurrentUserName( ) function is case sensitive. All RSView 3.20 and earlier user names use uppercase letters.

When the application starts, the DEFAULT user is logged in. The DEFAULT user is also logged in when a user logs out.

To assign visibility animation to the goto display button

1. Right-click the goto display button, select Animation, and then click Visibility.
2. In the Animation dialog box, in the Expression box, type this:

   CurrentUserName( ) <> "DEFAULT"
3. For the Expression True State, click Visible.
4. Click Apply.

Example: Assigning visibility animation to the shutdown button

This example shows how to assign visibility animation to the shutdown button so that only the ADMIN user can stop the application.

To assign visibility animation to the shutdown button

1. Right-click the shutdown button, select Animation, and then click Visibility.
2. In the Animation dialog box, in the Expression box, type this:

   CurrentUserName( ) == "ADMIN"
3. For the Expression True State, click Visible.
4. Click Apply.

Example: Assigning visibility animation to the shutdown button

This example shows how to assign visibility animation to the shutdown button so that only users assigned code G or code H can stop the application.

To assign visibility animation to the shutdown button

1. Right-click the shutdown button, select Animation, and then click Visibility.
2. In the Animation dialog box, in the Expression box, type this:

   CurrentUserHasCode(GH)
3. For the Expression True State, click Visible.
4. Click Apply.

12 Setting up language switching

This chapter describes:

- what language switching is.
- summary of steps for setting up language switching.
- setting up Windows® to support language switching.
- adding languages to the application.
- exporting application text strings for translation.
- translating application text.
- importing translated text files.
- setting up multiple language support for graphic libraries.

About language switching

The FactoryTalk® View language switching feature provides the ability to set up multiple languages for an application and switch languages dynamically at run time. You specify an initial language for the run-time application when you create it, and select the languages that will be available at run time. You can use up to 40 languages per development application, and 20 languages per run-time application.

When the application runs, operators can change the language using a language switch button. Set up a different language switch button for each language.

With language switching you can:

- develop an application in one language, export the user-defined text strings for the application, and then import translated strings for up to 40 languages into the same application.
- export an application's text strings in multiple languages into a single Microsoft® Excel spreadsheet.
- import text strings in multiple languages from a Microsoft Excel spreadsheet into your application in a single operation.
- use the same application in different countries, allowing operators in each location to view the application in their own language.
- allow operators in multilingual countries to use the language of their choice.

- import application components developed in different countries into a single application that supports multiple languages.

The default language

For applications that use multiple languages, you can specify one of the languages as the default language. Any undefined text strings in the other languages can be displayed in the default language.

The default language is also used for RSView Machine Edition 4.00 applications. When you open or import the application into FactoryTalk View 5.00 or later, the application's alarm, information, and local messages are associated with the language that you select to be the default language. For example, if you open an RSView Machine Edition 4.00 application that contains local messages, and you select French for the default language, the local messages will be treated as if they are French when you export the application's strings for translation. That is, they will appear in the French language column. You can add other languages for these messages, as described in this chapter.

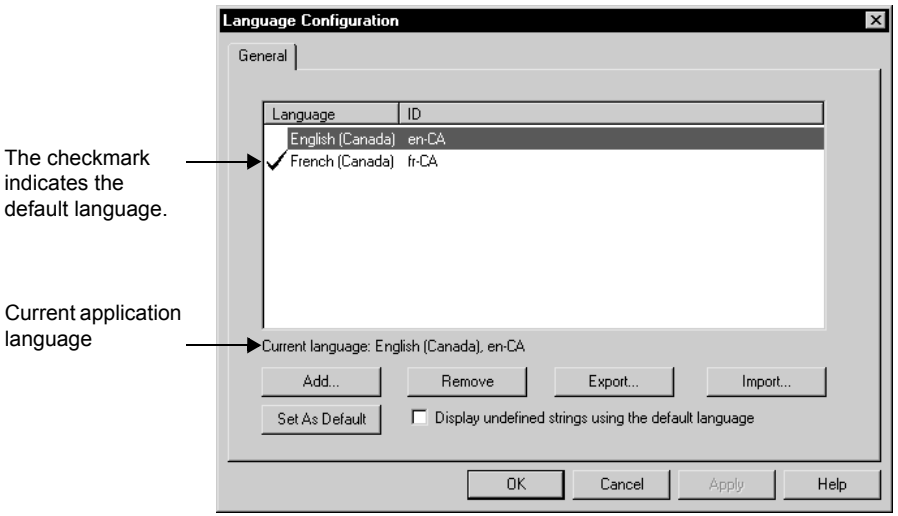
When you create a new application, the language you specify for the application is the default language. You can change the default language at any time. The default language can be any of the languages in the application.

You can display undefined strings in the default language during application development. If you do not select this option, undefined strings are displayed as a question mark "?" character. If you select this option, but do not include the default language with the run-time application, undefined strings are displayed as a question mark "?" character at run time.

Alarm trigger labels are displayed in the Trigger Label Selector list using the default language. If you change the default language, you must re-specify the trigger labels for every graphic object that filters alarms. To do this, specify the trigger label names in the new default language. For more information about filtering alarms when your application uses multiple languages, see page 9-5.

To change the default language

1. On the Tools menu, click Languages.



2. Select the language to use for the default language.
3. Click Set As Default. A large checkmark to the left of the selected language indicates that it is now the default language.
4. To use this language for all undefined strings in the application, select Display undefined strings using the default language.

Summary of steps

Follow these steps to set up language switching for an application:

1. For applications that will run on a personal computer, install the Windows languages that the application will use.
2. For applications that will run on a PanelView™ Plus or PanelView™ Plus CE terminal, set up the fonts that the application will use.
3. Create, open, or import the application in the language of your choice. For details, see Chapter 4.
4. Add languages to the application. For details, see page 12-5.
5. Create graphic objects and specify the text strings that they will use.

6. Create alarm, information, and local messages.
7. Create a language switch button for each language you plan to use at run time. For details, see Help.
8. Export the application text strings for translation. For details, see page 12-6.
9. Translate the text strings. For details, see page 12-9.
10. Import translated text strings for each of the translation languages. For details, see page 12-13.
11. Open the application in each language, to check the layout of the translated text.
12. Create the run-time application, specifying the startup language and the languages that the operator can switch to. For details, see Chapter 14.

Setting up Windows for language switching

Installing Windows languages

We recommend that you install all the languages that your application will use, on both the development and run-time computers. Installing languages turns on the Windows font support features, which allow applications to display characters for different languages using a single application font.

For details about installing languages, see Windows Help.

PanelView Plus 6, PanelView Plus and PanelView Plus CE terminals are shipped with languages already installed.

Setting up Windows fonts

For applications that will run on a PanelView Plus 6, PanelView Plus or PanelView Plus CE terminal, install the fonts that the application will use. For applications that will run on a personal computer, the fonts you want are generally installed when you install the languages for the application. Be aware that using MS Ariel Unicode as the default font makes a better performance for language switching.

For details about choosing fonts that work well with language switching, see page 20-12.

Make sure that the development and run-time computers are set up to use the fonts you want for the title bar and inactive title bar. Specify the font in the Windows Control Panel, in the Display Properties dialog box.

For information about setting up fonts on a PanelView Plus 6 PanelView Plus or PanelView Plus CE terminal, see the *PanelView Plus Terminals User Manual*.

Windows locale settings

Windows locale formatting determines how the application displays time, date, and floating point values at design time and run time.

When the application language is switched, the locale settings for the new language are used even if that language has not been installed.

You do not need to edit the default locale settings.

Adding languages to the application

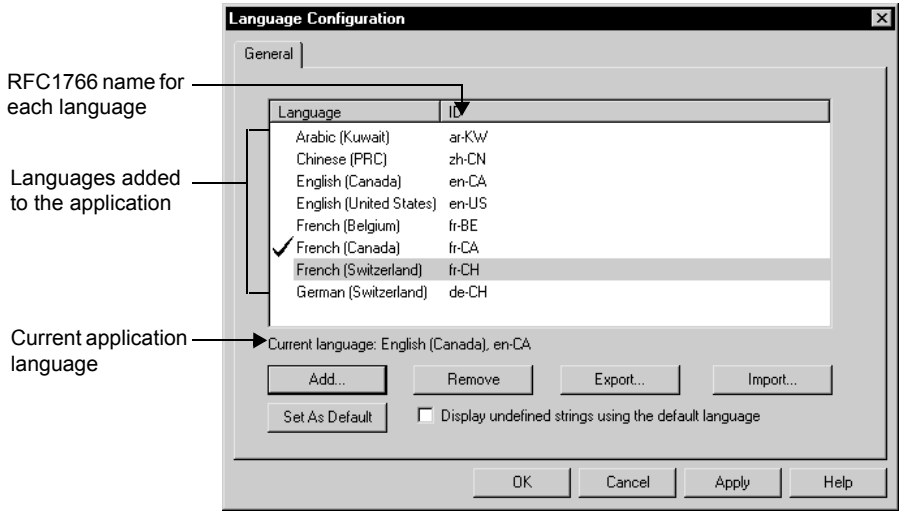
Use the Language Configuration dialog box in FactoryTalk View Studio to add up to 40 languages to the application.

Add languages before you:

- create language switch buttons.
- create the run-time application.

To add languages to an application

1. On the Tools menu, click Languages.



2. Add languages. For details, see Help.

Removing languages

You can also use the Language Configuration dialog box to remove languages. When you remove a language, all the strings for the language are deleted the next time you save the application. Saving a component deletes strings for the removed language from the component.

Exporting application text strings for translation

There are two options for exporting text strings:

- one language at a time, saving the text in a tab-delimited text file in Unicode format. The file can be translated and then imported back into the application.
- all languages at once, exporting into a single Microsoft Excel spreadsheet. The strings in the spreadsheet can be translated and then imported back into the application.

These text strings allow language switching and are exported for translation:

- display titles for On Top displays (defined in the Display Settings dialog box)
- text graphic objects
- captions that you define for graphic objects, including objects in global object displays
- alarm, local, and information messages
- alarm trigger labels
- embedded time, date, and numeric variables

Undefined strings are exported as undefined strings, regardless of whether you select the option in the Language Configuration dialog box to display undefined strings using the default language. That option is used only for displaying strings during application development and at run time. It does not substitute the default language's strings for undefined strings in the exported file or spreadsheet.

Exporting text in Unicode format

When you export text in Unicode format, these text strings are also exported:

- text descriptions and error messages for the Change Password window. These strings are exported if you use a password button in your application.

You can translate these strings, but you cannot change their language dynamically at run time the way you can for graphic object strings.

For the Change Password window, the run-time application will use the strings that are in the application when the run-time application is created. For example, if the current application language is French, and you have imported French text strings for the Change Password window, then the French strings will be compiled in the run-time application. If

the operator opens the window, the strings will be displayed in French. If the operator changes to another language, the strings will still be displayed in French.

Unicode file name format

The format for the exported Unicode text file name is <*ApplicationName*><*HMIServerName*><*RFC1766*>.txt, where:

- <*ApplicationName*> is the name of the application.
- <*HMIServerName*> is the name of the HMI server containing the text strings you exported. This is always the same name as the application name.
- <*RFC1766*> is the RFC1766 name associated with the language selected for the export operation.

For details about the schema of exported Unicode text files, see page 12-11.

For a list of Windows languages and the corresponding RFC1766 names, see page F-1.

Exporting text to a Microsoft Excel spreadsheet

FactoryTalk View supports Microsoft Excel versions 2000, 2002, 2003, 2007, and 2010. The exported file is in Microsoft Excel 5.0/95 Workbook format, with the extension .xls.

The maximum number of characters viewable in an Excel cell depends on the version of Excel and the font size. If the maximum is exceeded, the cell will be blank.

Optimizing duplicate strings

When you export text to an Excel spreadsheet, you have the option of optimizing duplicate strings. FactoryTalk View analyzes the text and indicates repeated instances of the same string using a reference number. This way the translator only needs to translate the text once. When you import the translated strings from the spreadsheet into the application, FactoryTalk View copies the translated string into all the graphic objects that used the string originally.

Excel spreadsheet file name format

The format for the exported spreadsheet file name is <*ApplicationName*>_<*ExportVersion*>.xls, where:

- <*ApplicationName*> is the name of the application.
- <*ExportVersion*> is an incremental number assigned to each successful export operation.

For details about the schema of exported spreadsheet files, see page 12-9.

For a list of Windows languages and the corresponding RFC1766 names, see page F-1.

Exported language string file locations

Exported language files are saved at this default location:

C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\Strings (Windows XP or Windows Server 2003 R2)

or

C:\Users\Public\Public Documents\RSView Enterprise\Strings (Windows Vista,Windows 7 Professional or Windows Server 2008)

You can specify another location if desired.

To export application text

1. On the Tools menu, click Languages.
2. In the Language Configuration dialog box, select the application language for which to export text strings.

   If you are going to export strings for all languages defined for the application, it does not matter which language is selected in the Language Configuration dialog box.
3. Click Export.
4. Follow the instructions in the String Import Export Wizard.

   For details about options in the String Import Export wizard, click Help.

If you export to a Unicode text file multiple times to the same location, previously exported versions are overwritten.

Problems exporting

You do not have to check every text file created during an export to verify that text strings were exported correctly. If errors occur, or if you cancel the export while it is in progress, a message appears in the Diagnostics List, and in the FactoryTalk® Diagnostics log file.

In addition, errors are displayed when they occur in a log file called ExportErrors.txt, which is saved at this location:

C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\Strings (Windows XP or Windows Server 2003 R2)

or

C:\Users\Public\Public Documents\RSView Enterprise\Strings (Windows Vista,Windows 7 Professional or Windows Server 2008)

Existing error log files are overwritten for each subsequent export operation that generates errors.

Translating application text in Excel spreadsheet files

This section contains information about the format and schema of the exported Microsoft Excel spreadsheet file.

The spreadsheet contains a header row followed by a row for each text string in the application. There is a column for each language defined in the application. The default language is first, followed by the remaining languages in alphabetical order by RFC1766 name. All cells use the text format.

Do not delete the header row in the spreadsheet. FactoryTalk View requires this information when you import the translated text into your application. Similarly, do not change the cell formats.

If you select the option to optimize duplicate strings, there is a reference column to the left of each language column. Do not change the information in the reference columns.

Translating application text in Unicode files

This section contains information about the format and schema of the exported Unicode text file. It also contains information about using Microsoft Excel or Windows Notepad to edit the file.

Because FactoryTalk View requires that parts of the text file remain the way they were exported, give the information in this section to the translator, to ensure that the file can be imported after it has been modified.

File name and format

You will likely want to rename the file before translating it, to avoid confusing it with the original file. You can use any file name ending with the file extension .txt.

To import text into a FactoryTalk View application, you must save the file as tab-delimited text, in Unicode text format.

Opening the text file in Microsoft Excel

When you open the text file in Microsoft Excel, the Text Import Wizard appears.

To specify the file format (Step 1 of the wizard)

1. Click Delimited.
2. In the Start import at row box, type or select 1.
3. In the File origin list, click Windows (ANSI).
4. Click Next.

To specify the field delimiter (Step 2 of the wizard)

1. Select the Tab check box. If any other check boxes are selected, clear them.
2. Make sure the "Treat consecutive delimiters as one" check box is cleared.
3. Click Next.

To specify the column data format (Step 3 of the wizard)

1. If it is not selected already, under Column data format, click General.
2. Click Finish.

Saving the text file in Microsoft Excel

To save the file

1. On the File menu, click Save.

   Excel warns that the file may contain features that are not compatible with Unicode text.
2. When prompted to keep the workbook in Unicode format that leaves out incompatible features, click Yes.
3. Close the file.
4. When prompted to save changes, click Yes.
5. When prompted again to keep the workbook in Unicode format that leaves out incompatible features, click Yes.

Differences in file format for files saved in Excel

If you use Notepad to open a Unicode text file that was saved in Excel, you will notice some differences from a file edited and saved in Notepad.

You do not have to change the format of the file before you import it into FactoryTalk View.

The differences are:

- Double quotes surrounding the string definitions are removed for most strings.
- String definitions containing embedded double quotes or other characters that Excel treats as special characters, such as commas, are enclosed within double quotes.
- Any embedded double quotes are converted to a pair of double quotes.

Saving the Unicode text file in Notepad

When saving the file, save it using the Unicode encoding option in the Save As dialog box.

File schema

Comments

The text file uses the # symbol as a comment delimiter if it is the first character on a line.

Header

The first seven lines of the text file contain header information that must not be translated or modified.

Body

The body of the text file starts on line eight, and includes the following columns:

[redacted]	Component type	Component name	String reference	"String definition"
[redacted]	Graphic Display	Pump station	1	"Stop motor"

The file is sorted alphabetically by component name, and then numerically by string reference number.

Each string reference number refers to a different object in the component. In the example shown above, string reference 1 might refer to a momentary push button in the graphic display called Pump station.

The string definition is enclosed in quotes in Notepad, but not in the spreadsheet column in Excel.

In the translated text file, the only text that can be modified is the text inside the quotation marks in the string definition column. For example, translated into German, the file would contain these changes:

	Component type	Component name	String reference	"String definition"
	Graphic Display	Pump station	1	"Motor abschalten"

Do not change the entries in the component type or component name columns, unless the component was renamed in the application after the text was exported.

Do not modify the string reference number. The string reference number is a unique number that is assigned to an object by FactoryTalk View. Modifying the string reference number prevents FactoryTalk View from identifying the object correctly when you import the text.

Working with pairs of double quotes

If a text string contains double quotes, the whole string definition must also be enclosed in double quotes. For example:

Call "Duty Manager"

must be entered in the string file as:

"Call "Duty Manager""

Importing text containing multiple sets of double quotes

If the string definition contains an odd number of double quotes, the number of double quotes is rounded down to an even number, and then each pair is imported as one double quote. For example, the string:

"Call "Duty Manager"

appears in the application as:

Call Duty Manager

Working with backslashes and new line characters

To force text to begin on a new line, precede the text with the characters **\n**. For example:

Motor\nStopped

appears in the application as:

Motor
Stopped

To make the characters \n appear as part of the text, type \\n.To make a backslash appear in the application, type two backslashes (\\).

Importing text containing multiple backslashes

If the imported text file contains an odd number of backslashes next to each other, one of the backslashes will be ignored.

For example, the string:

Seven\\\Eight

is imported into the application as:

Seven\Eight

Importing text

You can import text strings saved in Unicode text format or in Microsoft Excel spreadsheet format.

If your text strings are in Microsoft Excel spreadsheet format, only text strings that exist in the spreadsheet are imported. This means that existing strings in the application are not deleted during the import if they are not in the spreadsheet.

Back up the text in your application before importing. You can do this by exporting the text.

Save the backup file in a different location than the translated file you are about to import.

To import text into your application from a text file

1. On the Tools menu, click Languages.
2. In the Language Configuration dialog box, select the application language for which to import text strings.

If you are going to import strings for multiple languages defined in an Excel spreadsheet, it does not matter which language is selected in the Language Configuration dialog box.

3. Click Import.
4. Follow the instructions in the String Import Export Wizard.

   For details about options in the String Import Export wizard, click Help.

If you cancel the import before it is complete, any text strings that were changed are not restored to their original values. To restore the text that was originally in the application, import the text from the backup file you created.

Problems importing

You do not have to check every graphic display in your application to verify that text was imported correctly. If errors occurred while importing text, they are displayed automatically from a log file called ImportErrors.txt in the following folder:

C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\Strings (Windows XP or Windows Server 2003 R2)

or

C:\Users\Public\Public Documents\RSView Enterprise\Strings (Windows Vista,Windows 7 Professional or Windows Server 2008)

Each time errors occur while importing text into an application, the ImportErrors.txt file is overwritten.

If errors occurred while importing text, or if the import was canceled, a message appears in the Diagnostics List, and in the FactoryTalk Diagnostics log file.

Canceling importing

If some, but not all, of the text in an application seems to have been modified, the import might have been canceled. If you cancel the import before it is complete, any text strings that were changed are not restored to their original values. To restore the text originally in the application, import the text from the backup text file you created before importing.

Setting up multiple language support for graphic libraries

When you create an application, the graphic libraries installed with FactoryTalk View are "language neutral" by default.

This means that graphic objects in the libraries always display their text strings as shipped, regardless of the current application language. Since the current application language is ignored, text strings never appear as undefined.

You can change the default for any graphic library, so that it supports multiple languages instead of a single language. When you do this, when you open the library you can view the text strings that are defined for the current application language. If the library's text strings have not been defined for the current language, the undefined strings appear as single question marks.

If you turn off a graphic library's multiple language support, and then save the library, only strings for the current application language are saved. The current application language therefore becomes the "language neutral" language. Any strings for other languages are deleted.

To turn on support for multiple languages in a graphic library

1. Right-click an empty area in the graphic library display, and then click Display Settings.
2. In the General tab, select Support Multiple Languages.

After you turn on support for multiple languages, when you save the graphic library, all strings that support language switching are saved in the current application language. For information about saving libraries in multiple languages, see page 19-17.

Using graphic libraries that support multiple languages

To use the graphics libraries in an application, you can add a graphic library into the Displays folder or copy objects from a graphic library into a graphic display. If the graphic library supports multiple languages:

- when you add the graphic library into the Displays folder, all strings, including strings for languages that are not supported by the application, are included with the display.
- if you copy an object from the graphic library into a graphic display, only strings for languages supported by the application are copied.

For more information about using graphic libraries, see Chapter 19.

13 Setting up display navigation

This chapter describes:

- what display navigation is.
- developing a hierarchy of displays.
- testing display navigation.
- using graphic objects to navigate.
- controlling display changes remotely.

This chapter describes methods for navigating between graphic displays. For information about navigating between objects in a graphic display, see page 21-7.

About display navigation

The term display navigation refers to the way the operator moves between the graphic displays that make up an application.

Use these methods to set up display navigation for your application:

- Develop a hierarchy of graphic displays, to chart how users will navigate the application.
- Determine which users will have access to which parts of the application.
- Create graphic objects that the operator can use to navigate the application.
- Use the Remote Display Number connection to automatically control display changes. The use of this connection is optional. Assign it in the Global Connections editor.
- In the Startup editor, specify the graphic display to open when the application starts.
- Set up security so that only authorized users have access to the application or parts of the application.

  For information about setting up security, see Chapter 11.

Developing a hierarchy of displays

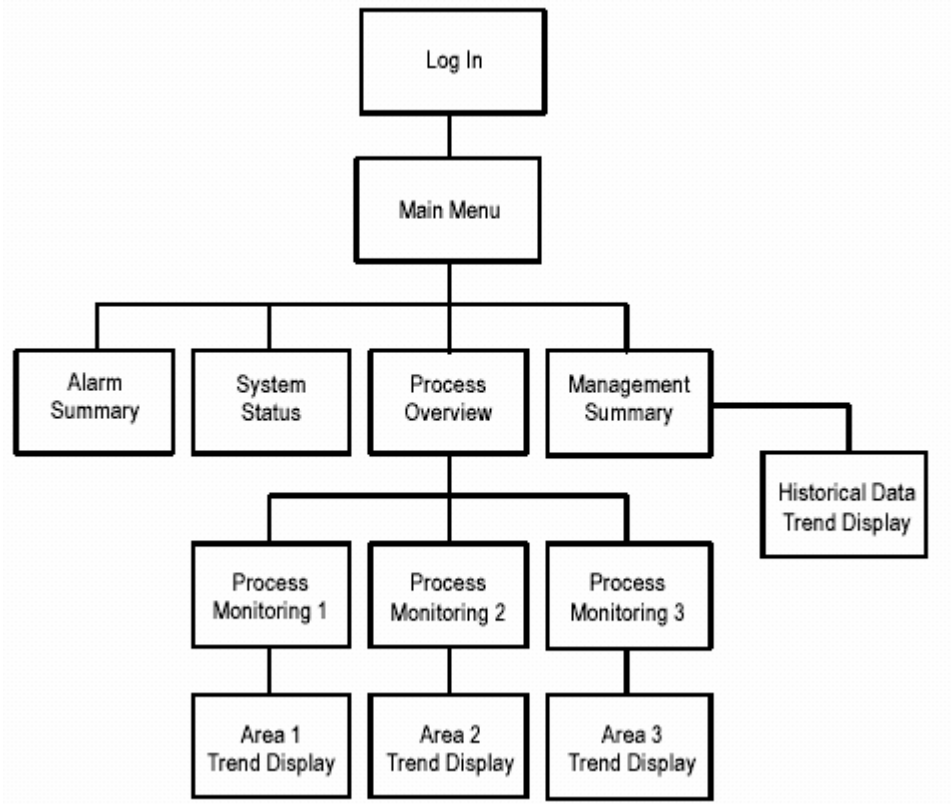
A display hierarchy is a series of graphic displays that provide progressively more detail as users move through them. Design your display hierarchy to meet the needs of the various users, including managers, supervisors, and operators.

If you plan to use security, determine which groups of users need access to which displays, and decide where in the hierarchy to locate login, logout, password, and shutdown buttons. For information about setting up security, see Chapter 11.

A display hierarchy could include:

- an initial graphic display for logging in.
- a graphic display that serves as a menu.
- an overview of the plant.
- a comprehensive display of each process being monitored.
- process-specific displays that provide more detail.
- management summary displays.
- trend displays of historical and current data.

The following illustration shows a sample display hierarchy.



Testing display navigation

Once you set up display navigation for your application, test the application to make sure that navigation flows smoothly and that you have avoided problems like these:

- A graphic display contains no buttons for moving forward or back.
- When a graphic display closes, no other display is open and there is no way to continue using the application.

For information about testing your application, see page 14-2.

Using graphic objects to navigate

Use these graphic objects to navigate through the displays in the application:

Use this object	To do this
Goto display button	Open the specified graphic display.
Goto configure mode button	Stop the application and open the FactoryTalk® View ME Station dialog box.
Return to display button	Close the current display and open the previous display.
Close display button	Close the current display. Can send a value to a tag when the display closes.
Display list selector	Provide a list of graphic displays so the operator can select which display to open.
Shutdown button	Stop the application and exit FactoryTalk® View ME Station.

The behavior of these graphic objects depends on which types of graphic displays are used. See the following sections for details.

For detailed information about setting up graphic objects, see Help.

Switching languages

If the application uses multiple languages and operators will be switching languages at run time, place language switch buttons in a display that the operators have access to. For example, put the buttons in the display that opens when the operators log in. Create a language switch button for each language that the operators will be using.

For more information about setting up multiple languages, see Chapter 12.

Display type

The display type you use gives you additional control over how the operator navigates between displays. For example, use the On Top type to keep a graphic display on top at all times, even when another display has focus. Or use the Replace type if you want a display to replace all other open displays when it opens.

For more information about display types, see page 19-12.

Goto display buttons

When you set up a goto display button, specify the graphic display to open when the operator presses the button at run time.

The specified display doesn't open if the operator does not have security access for the display.

You can also assign a parameter file or parameter list that assigns tags to tag placeholders in the display when the display opens. For more information about parameter files and lists, see Chapter 25.

For information about setting up goto display buttons, see Help.

How display types affect the button's behavior

The goto display button's behavior at run time also depends on which types of graphic displays are already open and which type of display it is opening:

- If the graphic display assigned to the button is a Replace display, it closes any open On Top or Replace displays. It does not close any On Top displays that use the Cannot Be Replaced option.
- If the display assigned to the button is already open, but does not have focus, pressing the button gives the display focus.

The operator cannot use the goto display button to open Replace displays if display change is currently controlled remotely (using global connections). But the operator can still open On Top displays.

Goto configure mode buttons

When the operator presses a goto configure mode button at run time, the current application stops running and the FactoryTalk View ME Station dialog box opens.

While in configure mode, the operator can use FactoryTalk View ME Station to change applications, application settings, and terminal settings. The operator can also delete log files. For more information about the FactoryTalk View ME Station dialog box, see Chapter 15.

Return to display buttons

When the operator presses a return to display button at run time, the graphic display that the button is on closes and the display that was previously open reopens.

The current display does not close if:

- the display change is currently controlled remotely (using global connections).
- there were no previously opened Replace displays.
- the operator does not have security access for the previous display. This can only occur if a new user logs in using a login button in the current display.

The return to display button only goes back to the most recent display. It doesn't go back through a series of displays.

For information about setting up return to display buttons, see Help.

How display types affect the button's behavior

Both the current display and the previous display must be Replace displays. When the operator presses the return to display button:

- If the graphic display that is closing is a Replace display, the display closes and the previously opened Replace display opens. Any On Top displays that were previously open with the Replace display are not reopened.
- If the graphic display that is closing is an On Top display, the display closes but no display is reopened.

We therefore recommend that you use return to display buttons in Replace displays only.

Example: Navigating through displays

This example uses the display hierarchy illustrated on page 13-2, and shows what happens as the operator navigates through the hierarchy. The graphic displays are all Replace displays.

1. In the Main Menu display, the operator uses a display list selector to open the Process Overview display.
2. In the Process Overview display, the operator presses a goto display button to open the Process Monitoring 1 display.
3. After viewing the state of the process, the operator presses a return to display button to close the current display and reopen the Process Overview display.

4. In the Process Overview display, the operator presses a return to display button. Which display opens? The Process Monitoring 1 display (because this was the previously opened display).

   To return to the Main Menu display from the Process Overview display, the operator would have to press a goto display button that is set up to open the Main Menu display.

Close display buttons

When the operator presses a close display button at run time, the graphic display that the button is on closes. You can set up the button to write out a value when the display closes.

If the graphic display that is closing is a Replace display, and the display change is controlled remotely, the display does not close. If the display does not close, the close value, if any, is not written out.

If the display change is controlled by the operator and the graphic display that is closing is a Replace display, if there are no On Top displays open, an empty window is displayed. The operator will not be able to use the application again (unless a remote display change occurs or an alarm, activity, or information message display opens).

We therefore recommend that you use close display buttons in On Top displays only.

For information about setting up close display buttons, see Help.

Display list selectors

Use the display list selector to show a list of graphic displays that the operator can choose from. The operator can scroll through the list and select the graphic display to open.

The specified display doesn't open if the operator does not have security access for the display.

You can also assign a parameter file or parameter list that assigns tags to tag placeholders in the display when the display opens. For more information about parameter files and lists, see Chapter 25.

For information about setting up display list selectors, see Help.

How display types affect the selector's behavior

The display list selector's behavior at run time also depends on which types of graphic displays are already open and which type of display it is opening:

- If the selected graphic display is a Replace display, it closes any open On Top and Replace displays. It does not close On Top displays that use the Cannot Be Replaced option.
- If the selected display is an On Top display, it opens on top of the current display. The current display does not close.

The operator cannot use the display list selector to open Replace displays if display change is currently controlled remotely. But the operator can still open On Top displays (with or without the Cannot Be Replaced option).

Selecting the display to open

The operator can scroll through the list and select displays using the key button graphic objects, or, if the list has the input focus, by using the arrow keys and Enter key on a keypad or external keyboard.

You can link key buttons to a specific display list selector, or set up the buttons to work with whichever object is selected in the graphic display.

For information about input focus, see page 21-8. For information about linking buttons to the display list selector, see page 21-9.

Shutdown buttons

When the operator presses the shutdown button at run time, the application stops and FactoryTalk View ME Station closes.

To prevent an unauthorized user from stopping the application, assign visibility animation to the shutdown button. For details, see page 11-14. Or, place the button in a display that only authorized users have access to.

For information about setting up shutdown buttons, see Help.

Controlling display changes remotely

To control display changes remotely, you can set up the data source to open graphic displays using global connections.

Global connections are connections that apply to your entire run-time application. Global connections allow the data source to control or interact with your application at run time.

For example, the Remote Display Number connection is a global connection that you can use to control display changes from the data source. You can also use global connections

to apply parameters to the displays that are opened from the data source, to close one or more On Top displays from the data source, to print graphic displays from the data source, to run macros from the data source, to control the date and time displayed on the run-time terminal, to set the intensity of PanelView backlights, and to monitor run-time RAM usage. For more information about global connections, see Chapter 8.

14 Creating run-time applications

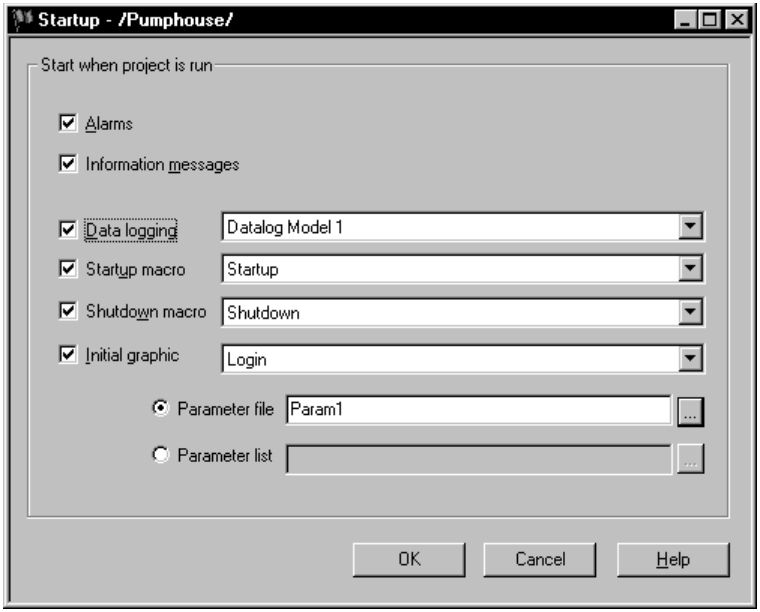
This chapter describes:

- specifying startup settings.
- testing your application.
- creating run-time application files.
- converting run-time application files to development applications.

Specifying startup settings

Use the Startup editor to specify which application processes and components to start when the application starts at run time.

You can specify startup settings once you've set up all the parts of the application, or you can specify processes and select components in the Startup editor as you create them.



For detailed information about the options in the Startup editor, see Help.

Testing your application

You can test your application in FactoryTalk® View Studio at any time during the development process, to make sure that everything works the way you intend.

If the development computer is connected to the data source, you can test all functions of the application, including security settings, language switching, communications, and alarm monitoring.

A FactoryTalk View ME Station emulator opens on the development computer and runs the application. This run-time version of the application is a temporary version for testing use only. You cannot run it on another computer.

There is a two-hour time limit for test running the application in FactoryTalk View Studio.

The procedure in this section shows you how to test your entire application. For information about testing a single graphic display, see page 19-10.

To test your application in FactoryTalk View Studio

Test Application tool

1. On the Application menu, click Test Application, or click the Test Application tool.
2. If your application uses multiple languages, specify the languages to include and the initial run-time language, and then press Finish. For details, see Help.
3. Test your application.
4. To stop your application, press a shutdown button, or type the character 'x.'

   Make sure you provide the operator with a method for shutting down the application at run time. For more information about methods for shutting down applications, see page 15-5.

Once you've tested your application to make sure everything works the way you intend, create the run-time application file and transfer the file to the run-time computer.

Creating run-time application files

Before you can run your application, you must create a run-time version. When you create the run-time version, FactoryTalk View Studio compiles all of the necessary application information into a single file with the extension .mer.

Creating .mer files for previous versions

You can specify the version of FactoryTalk View ME Station for which to create the .mer file. For example, if the application will run on a terminal that uses FactoryTalk View ME Station version 3.20, you can specify that version for the .mer file..

Starting with FactoryTalk View ME version 5.1, you can no longer create version 3.0 ME run-time projects.

Version 6.0 or earlier .mer files created on a 64-bit operating system will not run on FactoryTalk View ME Station 6.0 or earlier installed on personal computers.

If the application contains features that are not supported by the version you select, FactoryTalk View displays a validation report that lists the unsupported features. The run-time application file is not created. You must remove or turn off the unsupported features before you can create the run-time application file.

For information about the features supported in different versions of FactoryTalk View, and how to remove or replace them, see Appendix G.

Creating .mer files for PanelViewPlus

For FactoryTalk View version 6.1 or later some PanelViewPlus project screen size settings can not be used when creating some ME run-time projects.

- PanelViewPlus 400/600 terminals only support run-time projects (.mer) created for version 5.1 and earlier.
- PanelViewPlus Compact 400/600/1000 with a screen size of 640 x 480 or 320 x 240 only support run-time projects (.mer) created for version 5.1.

Converting .mer files to development applications

- For FactoryTalk View version 5.00 and later .mer files, you can convert the run-time .mer file back to a development application (.med file). This option is useful if: you lose or don't have access to the original .med file and you need to make a change to the application.
- you make changes to the .mer file at run time, such as adding passwords, updating RSLinx® Enterprise™ device shortcuts, or saving recipes, and you need to make a change to the application but don't want to lose this run-time information.

you need to extract information that was generated at run time, such as updated RecipePlus files. .

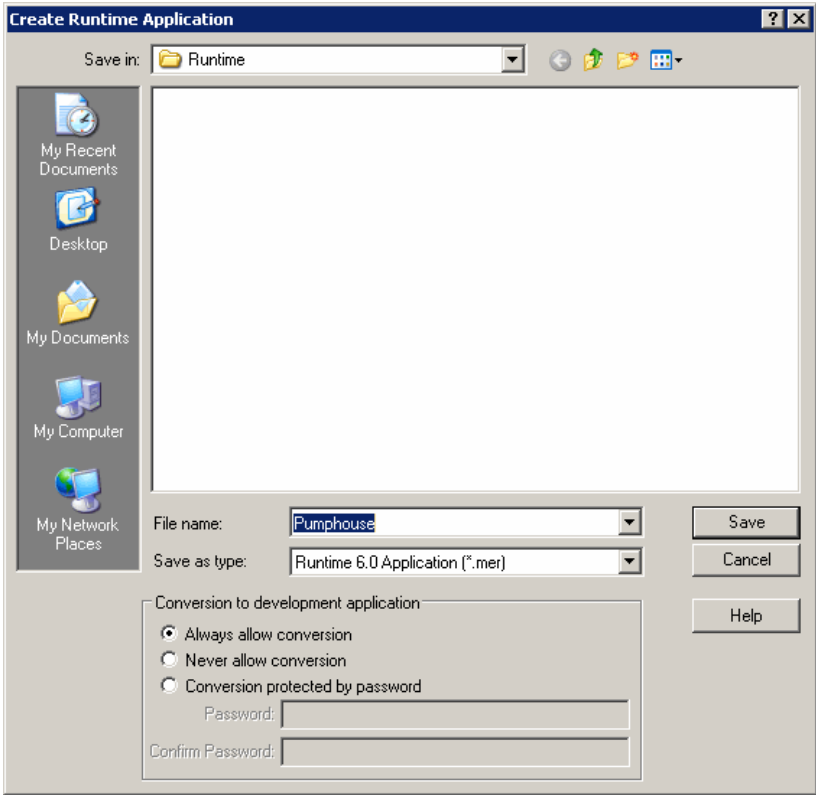
Version 6.0 or earlier .mer files created on a 64-bit operating system are not allowed to be converted to MED files. So if you are creating a version 6.0 or earlier .mer file on a 64-bit operating system, never allow a conversion that is the default and only choice under the Conversion to development application frame.

When you create the .mer file, you can specify whether or not to allow conversion of the run-time .mer file, and whether to require a password to convert the run-time application.

For more information about converting .mer files to development applications, see page 14-7.

To create a run-time application

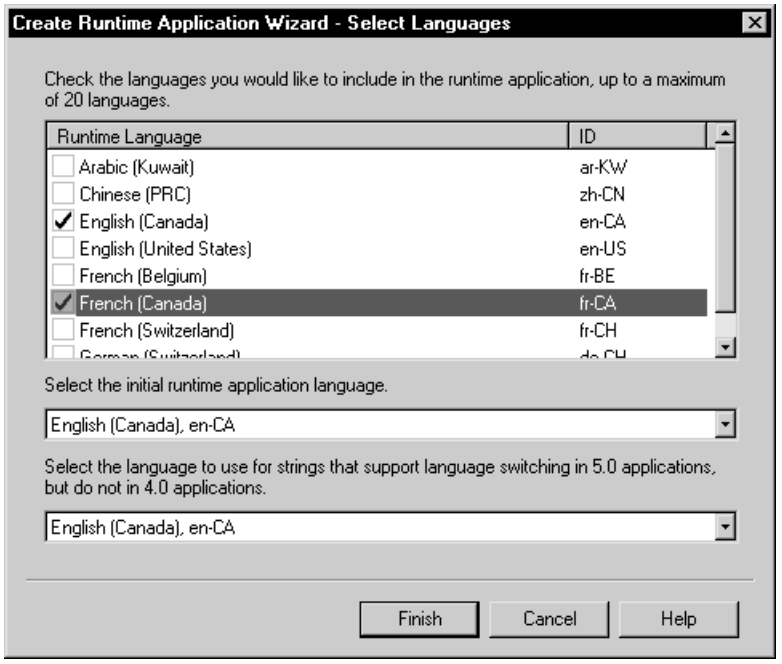
1. In FactoryTalk View Studio, with the application open, on the Application menu, click Create Runtime Application.



2. Specify the folder and file name for the run-time application.
3. In the Save as type box, specify the version of FactoryTalk View ME Station for which to create the .mer file.
4. For version 5.00 and later .mer files, if you don't want to allow the run-time application to be converted to a development application, click Never allow conversion.
5. For version 5.00 and later .mer files, if you require that the user enter a password to convert the application, click Conversion protected by password. Type the password in the two boxes.

The password can be up to 100 characters long. The password is case sensitive.

6. Version 6.0 or earlier .mer files created on a 64-bit operating system are not allowed to be converted to .med files. So if you are creating a version 6.0 or earlier .mer file on a 64-bit operating system, never allow a conversion that is the default and only choice under the Conversion to development application frame.
7. Click Save.



8. If your application uses multiple languages, specify up to 20 languages to include in the run-time application, specify the initial run-time language, and specify the language to use for alarm trigger labels and alarm, information, and local messages in FactoryTalk View 4.00 run-time applications. For details, see Help.

   This wizard is not displayed if your application uses only one language.

   To display undefined strings in the default language at run time, include this language in your selection. The default language is also required for filtering alarms. For more information about the default language, see page 12-2.
9. Click Finish.

For information about transferring the run-time application:

- to a personal computer, see Chapter 15.
- to a PanelView™ Plus or PanelView™ Plus CE terminal, see Chapter 16.

Converting run-time application files to development applications

For FactoryTalk View version 5.00 and later .mer files, you can convert the run-time application file back to a development application. This allows you to make changes to the application without losing run-time information such as passwords and RecipePlus data.

To convert the run-time application file, use the Restore runtime application operation in the Application Manager. Data logging and alarm data that occurred at run time are not restored to the development application.

If your application uses FactoryTalk Security, you must have write, backup, and restore permissions to convert the run-time application to a development application. For more information about FactoryTalk Security, see Chapter 11.

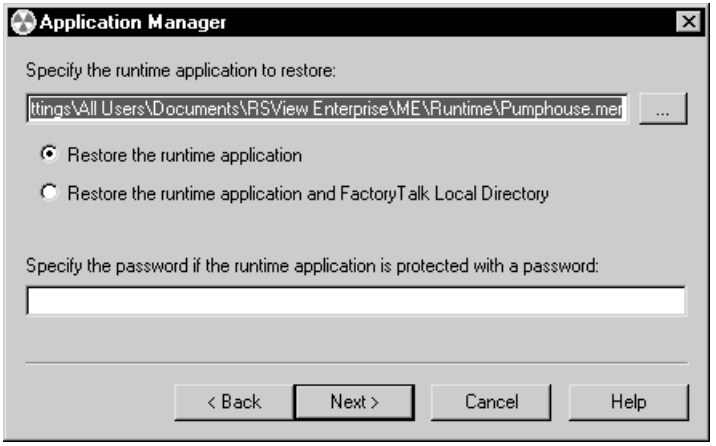
If desired, you can also restore the run-time application's FactoryTalk Local Directory to the development computer. The development computer's FactoryTalk Local Directory will be backed up, and the run-time version will replace it. If you choose this option, make sure you have access to the run-time FactoryTalk Local Directory. For more information about the FactoryTalk Local Directory, see Chapter 11.

RSLinx Enterprise device shortcuts that were edited at run time are restored when you convert the run-time application to a development application. However, the Runtime tab in the RSLinx Enterprise Communication Setup editor might not display the device configuration for the run-time application. Make sure the Runtime tab shows the correct device configuration before making any changes to the shortcuts.

RSLinx Enterprise device shortcuts that were valid on the run-time terminal might not exist or might be invalid on the development computer. Review all device and tag file shortcut assignments in the RSLinx Enterprise Communication Setup editor before you edit, test, or transfer the application.

To convert a run-time application to a development application

1. In FactoryTalk View Studio, on the Tools menu, click Application Manager.
2. When prompted to select the application type, click Machine Edition, and then click Next.
3. Click Restore runtime application, and then click Next.


Application Manager
Specify the runtime application to restore:
ttings\All Users\Documents\RSView Enterprise\ME\Runtime\Pumphouse.mer
...
Restore the runtime application
Restore the runtime application and FactoryTalk Local Directory
Specify the password if the runtime application is protected with a password:
< Back
Next >
Cancel
Help

4. Specify the folder and file name of the run-time application to convert.
5. To restore the run-time application's FactoryTalk Local Directory to the development computer, click Restore the runtime application and FactoryTalk Local Directory.
6. If you created a password for the file when you created the run-time application, type the password.
7. Click Next.
8. Type a name for the converted application, and then click Finish.

15 Running applications on a personal computer

This chapter describes:

- moving applications to the run-time computer.
- starting FactoryTalk® View ME Station.
- loading and running applications.
- shutting down applications.
- editing device short cuts.
- looking up contact information for technical support.
- setting up FactoryTalk® Diagnostics at run time.
- setting up serial ports for KEPServerEnterprise.
- setting up RSLinx® Enterprise™ communication drivers.
- specifying the printers to use at run time.
- specifying startup options for FactoryTalk View ME Station.
- deleting log files on the run-time computer.
- specifying the time, date, and number formats to use at run time.
- using the DeskLock tool.

Summary of steps

Follow these steps to:

- install the necessary hardware and software on the run-time computer.
- transfer your Windows® 7 Professional, Windows XP Professional, Windows Server 2003 R2, Windows Vista, or Windows Server 2008 application to the run-time computer.
- set up options in FactoryTalk View ME Station.

For information about installing FactoryTalk View ME Station, see the *FactoryTalk View Machine Edition Installation Guide*.

Installing hardware and software on the run-time computer

1. If you will be printing displays, alarms, or diagnostics messages, set up printer connections on the run-time computer.

   For more information, see page 15-10.

2. If you are using RSLinx Enterprise, set up communications as described in Chapter 5.

3. If you are using RSLinx® Classic™ as the OPC® server on the run-time computer, install RSLinx Classic on the run-time computer.

4. If you are using RSLinx Classic on a remote computer, install RSLinx Classic on the remote computer.

5. If you are using an OPC server other than RSLinx Enterprise or RSLinx Classic, install the OPC server software on the run-time computer or on another computer on the network.

   For installation information, see the documentation supplied by your OPC server vendor. For information about OPC, see Chapter 5.

6. If your application uses third-party ActiveX® objects, install and register the Windows 7 Professional, Windows XP Professional, Windows Server 2003 R2, Windows Vista, or Windows Server 2008 version of the objects on the run-time computer.

   For information about ActiveX objects, see page 20-21.

7. Install on the run-time computer all languages used by the run-time application.

8. If the run-time computer uses different time, date, or number formats than the development computer, specify the time, date, and number formats to use at run time.

   For more information, see page 15-17.

9. If desired, use the DeskLock tool to prevent users from switching to another software application or using the Windows desktop at run time.

   For more information, see page 15-17.

Transferring the application

- Move the application to the run-time personal computer.

  For more information, see page 15-3.

Setting up options in FactoryTalk View ME Station

1. On the run-time computer, start FactoryTalk View ME Station.

   For more information, see page 15-4.

2. Load the application.

   For more information, see page 15-4.

3. Edit device shortcuts, if necessary.

   For more information, see page 15-6.

4. Set up FactoryTalk Diagnostics on the run-time computer (if you have not already done so).

   For more information, see page 10-6.

5. If you will be using KEPServerEnterprise™, specify serial port IDs.

   For more information, see page 15-8.

6. If you will be using RSLinx Enterprise, set up communication drivers (if you have not already done so).

   For more information, see page 15-9.

7. Specify the printers to use.

   For more information, see page 15-10.

8. Specify startup options for FactoryTalk View ME Station.

   For more information, see page 15-12.

Once you've completed these steps, you're ready to run the application. For information about running your application, see Chapter 17.

Moving applications to the run-time computer

The run-time application file has the extension .mer. You can use any standard file transfer method to copy your run-time application from the development computer to the run-time computer.

You can:

- copy the application file from the development computer to removable media such as USB thumb drive, USB hard drive, or a floppy disk, and then from the removable media to the run-time computer. If the application file is too large for the removable media, use a larger capacity removable media.
- if the development and run-time computers are on the same network, use Windows Explorer or My Computer to move the file.

For information about creating the run-time application file, see Chapter 14.

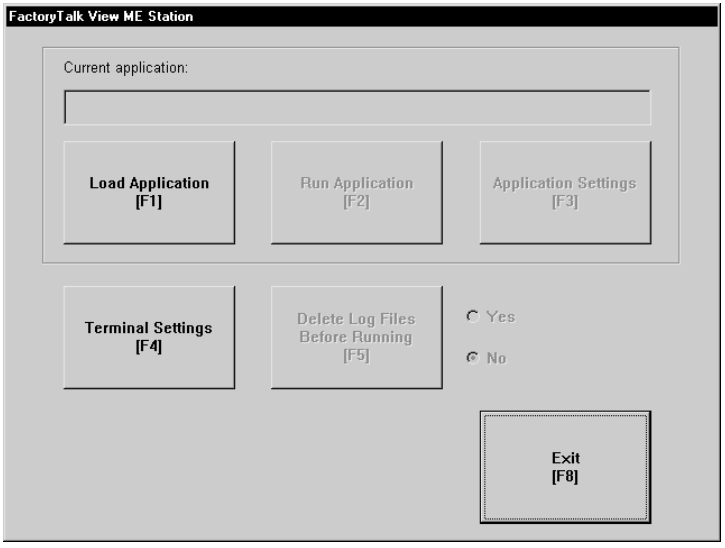
Starting FactoryTalk View ME Station

If you are running an application on the development computer, we recommend that you exit FactoryTalk View Studio before starting FactoryTalk View ME Station.

To start FactoryTalk View ME Station

- On the Windows Start menu, select Programs > Rockwell Software > FactoryTalk View, and then click FactoryTalk View ME Station.

  The FactoryTalk View ME Station dialog box opens.



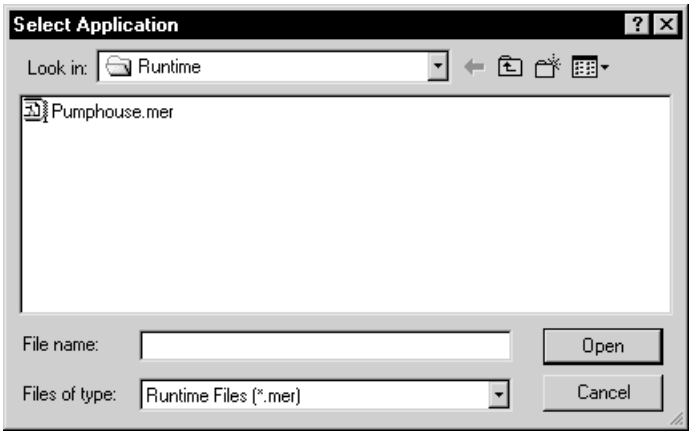
For information about specifying startup options for when FactoryTalk View ME Station starts, see page 15-12.

Loading and running applications

You can run any run-time application that is on the run-time computer. Run-time applications have the extension .mer.

To load and run the application

1. In the FactoryTalk View ME Station dialog box, click Load Application, or press F1.



2. Navigate to the folder containing the application's .mer file, and then click the file name.
3. Click Open.
4. To replace the run-time computer's communication settings with the application's communication settings, click Yes. To keep the run-time computer's communication settings, click No.

   You are notified that the application's FactoryTalk System Directory of users and security policies will be loaded on this computer. This is the set of users and policies that have been set up for the application and are contained in the .mer file.

   The computer's existing FactoryTalk System Directory will be archived, and will be restored when you stop the application. To turn off this warning, see page 15-16.
5. To continue, click Yes. To stop loading the application, click No.

   If you continue, the application name is displayed in the Current application box in the FactoryTalk View ME Station dialog box.
6. To run the application, click Run Application.

   The DEFAULT user is logged in. If a macro is assigned to the DEFAULT user, the macro runs.

Shutting down applications

To shut down an application, use one of these methods

- Press a shutdown button in a graphic display.

- If the application is set up to use a title bar with a Control box, click the Close button at the right end of the title bar.
- If the application is set up to use a title bar with a Control box, on the Control menu at the left end of the title bar, click Close.

For information about using a title bar in graphic displays, see page 4-15. For information about preventing unauthorized users from shutting down applications, see page 11-14.

What happens when the application shuts down

When the application shuts down:

- if you assigned a shutdown macro (in the Startup editor), the macro runs, assigning values to tags, and then the application stops.

  For information about the Startup editor, see Chapter 14.
- FactoryTalk View ME Station closes.
- The computer's FactoryTalk System Directory is restored.

Changing application settings

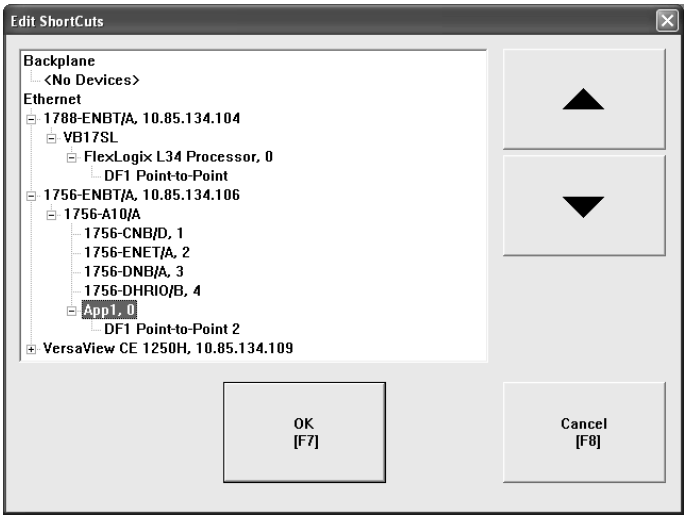
Editing device shortcuts

You can use FactoryTalk View ME Station to edit device shortcuts that have been set up in the application.

Before editing device shortcuts, load the application containing the device shortcut, as described on page 15-4.

To edit device shortcuts

1. In the FactoryTalk View ME Station dialog box, click Application Settings.
2. Double-click Device Shortcuts.
3. Double-click the name of the shortcut to edit.

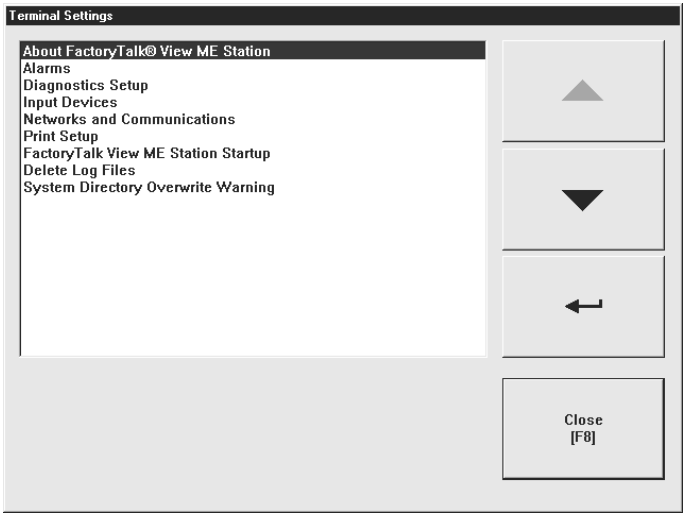


4. In the Edit ShortCuts dialog box, click the device you want the shortcut to point to, and then click OK.

Looking up contact information for technical support

To look up technical support contact information

1. In FactoryTalk View ME Station, click Terminal Settings.



2. Double-click About FactoryTalk View ME Station.
3. Click Technical Support.

   The telephone number and URL for technical support are displayed.

Setting up FactoryTalk Diagnostics on the run-time computer

You can set up FactoryTalk Diagnostics on the run-time computer using the FactoryTalk View ME Station dialog box.

To set up FactoryTalk Diagnostics on the run-time computer

1. In FactoryTalk View ME Station, click Terminal Settings.
2. Double-click Diagnostics Setup.

   The FactoryTalk Diagnostics Setup dialog box opens.
3. Set up FactoryTalk Diagnostics, as described on page 10-6.

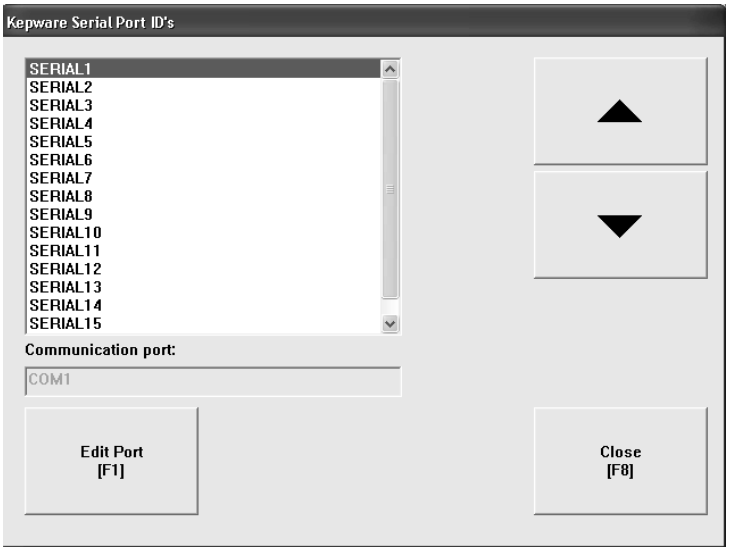
Setting up serial ports for use with KEPServerEnterprise

If you plan to use KEPServerEnterprise and serial communications, you must specify which COM port to use.

For information about setting up communications in KEPServerEnterprise, see KEPServerEnterprise Help.

To specify the COM port to use for serial communications

1. In the FactoryTalk View ME Station dialog box, click Terminal Settings.
2. Double-click Networks and Communications.
3. Double-click KEPServer Serial Port ID's.



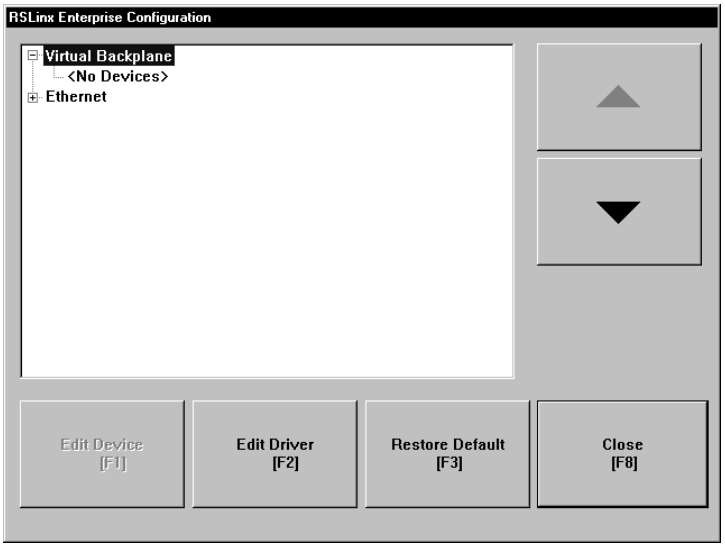
4. In the Kepware Serial Port ID's dialog box, click the serial port ID you specified when you set up the KEPServerEnterprise channel.
5. Click Edit Port.
6. In the Communication Ports dialog box, click the COM port to use for KEPServerEnterprise communications.

Setting up RSLinx Enterprise communication drivers

Use RSLinx Enterprise to set up communication drivers for your run-time application. You can set up the drivers directly in RSLinx Enterprise, or open RSLinx Enterprise by using the FactoryTalk View ME Station dialog box.

To set up the RSLinx Enterprise communication driver to use at run time

1. In the FactoryTalk View ME Station dialog box, click Terminal Settings.
2. Double-click Networks and Communications.
3. Double-click RSLinx Enterprise Communications.



4. To edit a driver, select it and then click Edit Driver.
5. To edit a device, select it and then click Edit Device.

For information about setting up RSLinx Enterprise drivers and devices, see the RSLinx documentation.

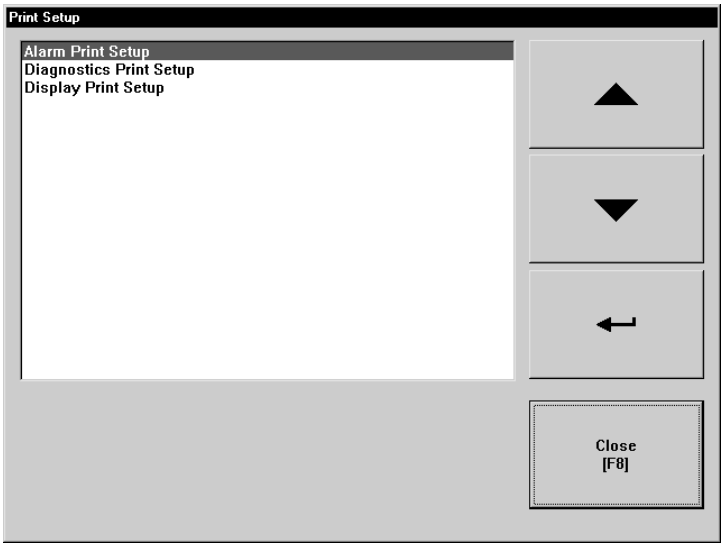
Once the driver is set up, FactoryTalk View ME Station automatically starts the driver software when you run the application.

Specifying the printers to use at run time

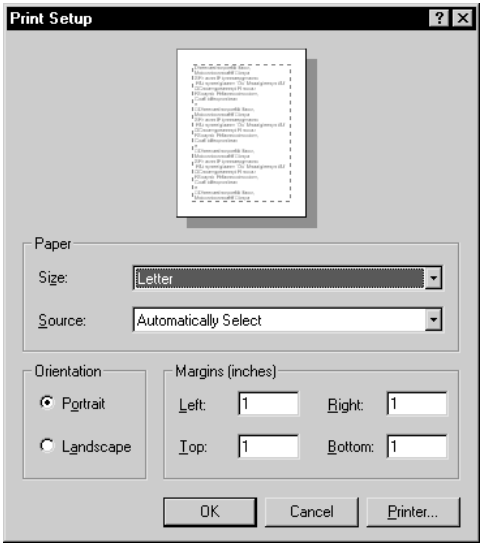
You can use local or network printers to print alarm messages, reports, diagnostics messages, and graphic displays at run time. If desired, you can use a different printer for each type of printing.

To specify the printers to use at run time

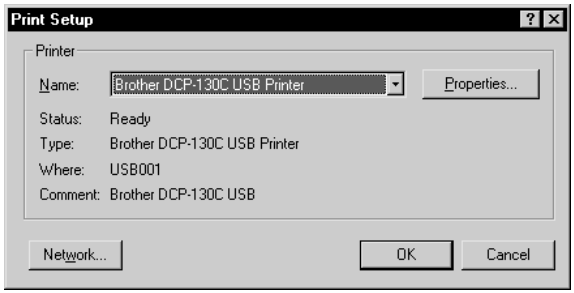
1. In the FactoryTalk View ME Station dialog box, click Terminal Settings.
2. Double-click Print Setup.



3. Double-click the type of printing to set up.



4. Click Printer.



5. Modify the print options as required.

For detailed information about printer options, refer to your Windows documentation.

Specifying startup options for FactoryTalk View ME Station

This section describes how to start FactoryTalk View ME Station automatically when Windows starts, and describes startup options for FactoryTalk View ME Station.

When you start FactoryTalk View ME Station, you can:

- run an application.
- load an application.
- automatically delete an application's log files before running the application.
- replace RSLinx Enterprise communications on the run-time computer with the application's settings.

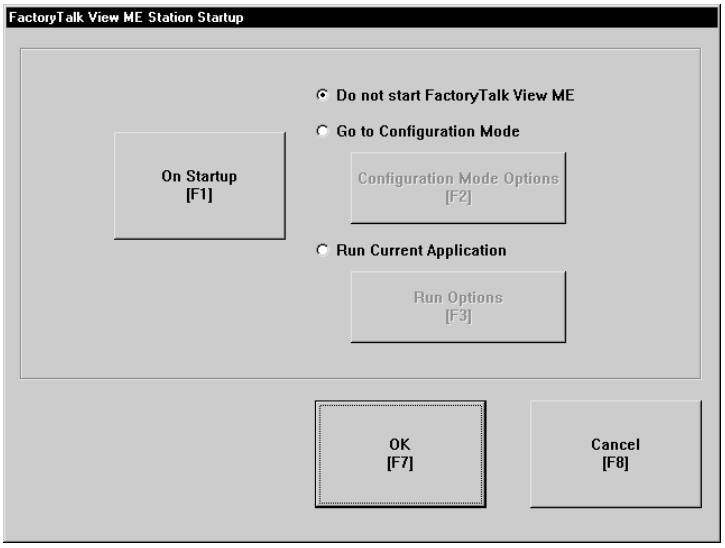
By default, the option to start FactoryTalk View ME Station when Windows starts is turned off. The settings in this section apply only if you want FactoryTalk View ME Station to start automatically when Windows starts.

To start FactoryTalk View ME Station and run an application when Windows starts

1. In the FactoryTalk View ME Station dialog box, load the application that you want to run.

   For details, see page 15-4.

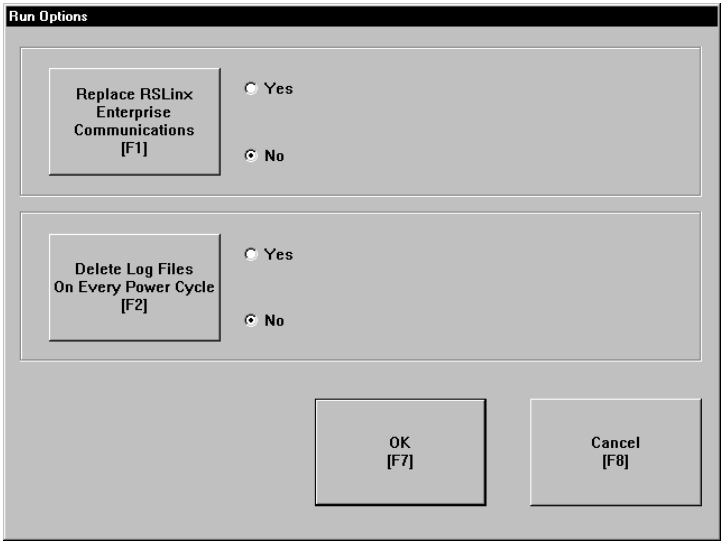
2. Click Terminal Settings.
3. Double-click FactoryTalk View ME Station Startup.



4. Click Run Current Application.

   This option is not available if you have not loaded an application yet.

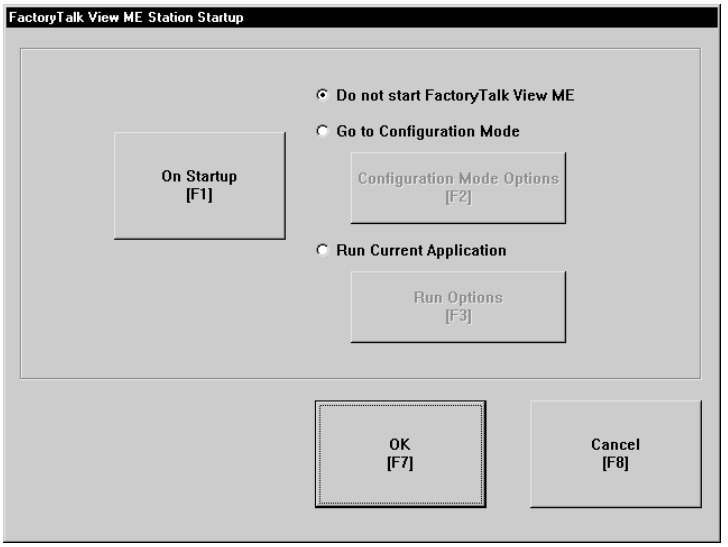
5. Click Run Options.



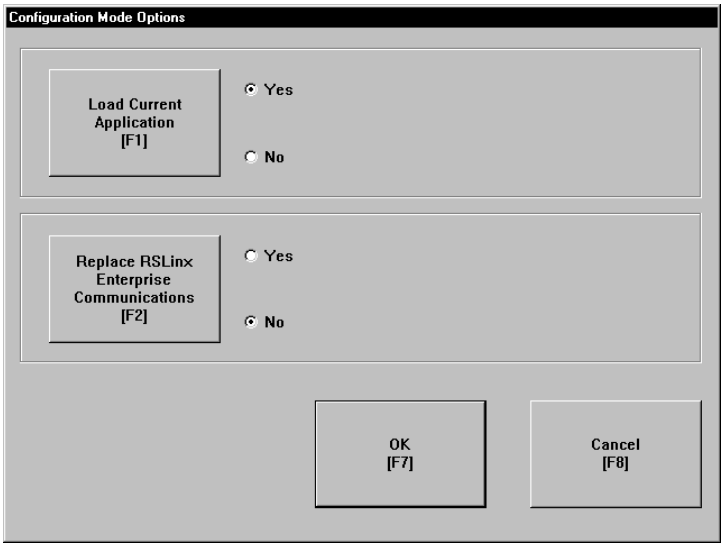
6. Specify whether to replace the RSLinx Enterprise communication settings on the run-time computer with the application's settings when the application starts.
7. Specify whether to delete the application's log files on startup.

To start FactoryTalk View ME Station without running an application when Windows starts

1. In the FactoryTalk View ME Station dialog box, click Terminal Settings.
2. Double-click FactoryTalk View ME Station Startup.



3. Click Go to Configuration Mode.
4. Click Configuration Mode Options.



5. Specify whether to load the current application when FactoryTalk View ME Station starts.

   This option is not available if you have not loaded an application.

6. Specify whether to replace the RSLinx Enterprise communication settings on the run-time computer with the application's settings when the application starts.

   This option is not available if you have not loaded an application.

Using Windows 7 Professional or Windows Vista or Windows Server 2008 with ME Station

In order to deploy a HMI system on Windows 7 Professional, Windows Vista or Windows Server 2008, one of the following options needs to be selected:

- The operator will need to log into Windows as a member of the Administrators group. The operator can then use MEStation for Windows.
- An administrator can disable the UAC. This allows a Windows user that is a member of the Users group to use ME Station for Windows.
- An operator that is a member of the Users group who knows an Administrators password, and can provide authentication when UAC prompts, can use ME Station.

This allows the operator to load and run an MER as well as configure ME Station for Windows using the Graphical User Interface.

Deleting log files on the run-time computer

When you run your application, FactoryTalk View ME Station stores log files for alarms and data logging (if you use these features). When you start FactoryTalk View ME Station, you can delete the alarm and data log files for the loaded application, or for all the applications on the run-time computer.

Running a newer version of the application

If you run a newer version of an application, the alarm log file for the older version is deleted automatically. The data log file for the older version is retained, to allow the display of historical data in trends.

For more information about the alarm log file, see page 9-10. For more information about data log files, see page 26-4.

Deleting log files manually

To delete log files for the loaded application

- In the FactoryTalk View ME Station dialog box, click Yes beside the Delete Log Files Before Running button.

All alarm and data log files for the loaded application are deleted.

To delete log files for all applications on the run-time computer

1. In the FactoryTalk View ME Station dialog box, click Terminal Settings.
2. Double-click Delete Log Files.
3. Click Yes.

Log files for data log models that use the default path are deleted. All alarm log files are deleted.

Turning off the FactoryTalk Directory Server warning

When you load an application, you are notified that the application's FactoryTalk System Directory of users and security policies will be loaded on the computer. The computer's existing FactoryTalk System Directory is archived while you run the application. It is restored when you stop the application. **You can turn off this notification warning.**

To turn off the overwrite warning

1. In the FactoryTalk View ME Station dialog box, click Terminal Settings.
2. Double-click System Directory Overwrite Warning.
3. Click No.

Specifying time, date, and number formats

Time, date, and number formats are used by these graphic objects:

- numeric display
- gauge
- time and date display
- trend
- alarm banner
- alarm list

The time and date formats are also used when printing the alarm history report (using the print alarm history button). The numeric and time and date embedded variables also use number, time, and date formats.

All objects use the time, date, and number formats of the current application language. For example, if the application language uses a comma for the decimal symbol, numeric variables use a comma for the decimal symbol.

For information about using multiple languages, see Chapter 12.

Using the DeskLock tool

Use the DeskLock tool to prevent users from switching to another software application or having access to the desktop at run time.

This tool can have far-reaching effects on your operating system. The DeskLock tool can replace the standard Windows 7 Professional, Windows XP Professional, Windows Server 2003 R2, Windows Vista, or Windows Server 2008 non-configured desktop with a customized desktop. The customized desktop is intended to prevent operators from having access to other applications and operating system functions such as restarting Windows or shutting down tasks. You can also use the tool to set up an automatic Windows logon and to specify options such as which software applications are allowed or not allowed to run on the computer.

Before using the tool, read the DeskLock Help completely.

To open the DeskLock tool

- On the Windows Start menu, select Programs > Rockwell Software > FactoryTalk View > Tools, and then click DeskLock.

For details about using the tool, see the tool's Help.

16 Transferring applications to a PanelView Plus terminal

This chapter describes:

- starting FactoryTalk® View ME Station.
- setting up communication drivers to use to transfer applications to a PanelView™ Plus CE. PanelView Plus or PanelView Plus 6 terminal.
- transferring applications and TrueType™ fonts to PanelView Plus,PanelView Plus CE or PanelView Plus 6 terminals.
- uploading applications from a terminal to the development computer.
- comparing applications on the development computer with applications on the terminal.

For information about using your application at run time, see Chapter 17.

For information about using FactoryTalk View ME Station on the terminal, including setting up communications, printers, and input devices, see the *PanelView Plus Terminals User Manual*.

Summary of steps

Follow these steps to:

- install hardware and software on a PanelView Plus, PanelView Plus CE or PanelView Plus 6 terminal.
- transfer your application to the PanelView Plus, PanelView Plus CE or PanelView Plus 6 terminal.

For information about installing FactoryTalk View ME Station, see the *FactoryTalk View Machine Edition Installation Guide*.

Installing hardware and software on a PanelView Plus terminal

1. If you will be printing displays, alarms, reports, or diagnostics messages, connect a printer to the USB or Network port.

   PanelView Plus terminals support printing using the Microsoft® Windows® CE PCL3 printer driver, which is already installed on the terminal. Printing is supported for most laser and ink-jet printers. If you have problems printing, check that your printer is compatible with the PCL3 printer driver.

2. If you are using an OPC® server other than RSLinx® Enterprise™, for example, KEPServerEnterprise™, install the OPC server software on the terminal.

   For installation information, see the documentation supplied by your OPC server vendor. For information about OPC data servers, see Chapter 5.

3. If your application uses third-party ActiveX® objects, install and register the Windows CE version of the objects on the terminal.

   For information about ActiveX objects, see page 20-21.

Installing printers on a PanelView Plus terminal

- If you will be printing displays, alarms, reports, or diagnostics messages, connect a printer to the USB or Network port.

  PanelView Plus terminals support printing using the Microsoft Windows CE PCL3 printer driver, which is already installed on the terminal. Printing is supported for most laser and ink-jet printers. If you have problems printing, check that your printer is compatible with the PCL3 printer driver.

The PanelView Plus terminal is a "closed box," which means you must order any software your application will need when you order the system. All software comes pre-installed.

Installing hardware and software on a PanelView Plus 6 terminal

1. If you will be printing displays, alarms, reports, or diagnostics messages, connect a printer to the USB or Network port.

   PanelView Plus 6 terminals incorporates the JETCET PRINT solution for Microsoft® Windows® CE devices, supporting select Canon, Epson, Hewlett-Packard, and Brother printers. Plug-and-play installation is supported for these printers as well as manual installation if a suitable JETCET print driver is available.

2. If you are using an OPC® server other than RSLinx® Enterprise™, for example, KEPServerEnterprise™, install the OPC server software on the terminal.

   For installation information, see the documentation supplied by your OPC server vendor. For information about OPC data servers, see Chapter 5.

3. If your application uses third-party ActiveX® objects, install and register the Windows CE version of the objects on the terminal.

   For information about ActiveX objects, see page 20-21.

Installing printers on a PanelView Plus 6 terminal

- If you will be printing displays, alarms, reports, or diagnostics messages, connect a printer to the USB or Network port.

PanelView Plus 6 terminals incorporates the JETCET PRINT solution for Microsoft Windows CE devices, supporting select Canon, Epson, Hewlett-Packard, and Brother printers. Plug-and-play installation is supported for these printers as well as manual installation if a suitable JETCET print driver is available.

Print support is centrally managed and independent of the application.You can add and configure a new printer from the desktop control panel. Printer configurations include the printer name, printer driver, port, and port-specific parameters. New configurations are retained through a power cycle.

Transferring applications

1. On the PanelView Plus, PanelView CE or PanelView Plus 6 terminal, start FactoryTalk View ME Station.

   For more information, see page 16-3.

2. In FactoryTalk View ME Station, if you're transferring via a serial connection, specify and set up the serial driver. If you are using Ethernet® for the transfer, you can skip this step.

   For more information, see page 16-4.

3. On the development computer, set up the RSLinx Enterprise driver to use for the transfer.

   For more information, see page 16-5.

4. Move the application to the PanelView Plus or PanelView Plus 6 terminal using the Transfer Utility tool.

   For more information, see page 16-6.

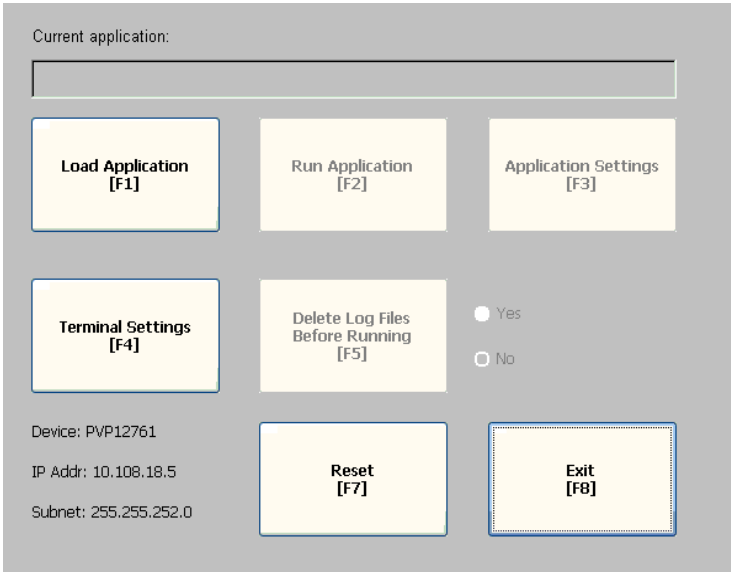
You can also transfer applications to the terminal using a Flash Card. For information about this method, see the *PanelView Plus Terminals User Manual*.

Starting FactoryTalk View ME Station

To start FactoryTalk View ME Station on a PanelView Plus 6 terminal

- On the Windows Start menu, select Programs > Rockwell Software, and then click FactoryTalk View ME Station.

  The FactoryTalk View ME Station dialog box opens.



Starting FactoryTalk View ME Station on a PanelView Plus terminal

If you are running a PanelView Plus terminal, the FactoryTalk View ME Station dialog box opens automatically when the terminal starts up.

Specifying the driver to use for the transfer

You can download the run-time application file to the PanelView Plus, PanelView Plus CE or PanelView Plus 6 terminal using:

- Ethernet
- a direct serial connection

If you are using an Ethernet connection for the transfer, you don't need to set up a driver for the transfer, since the Ethernet driver is selected and loaded by default.

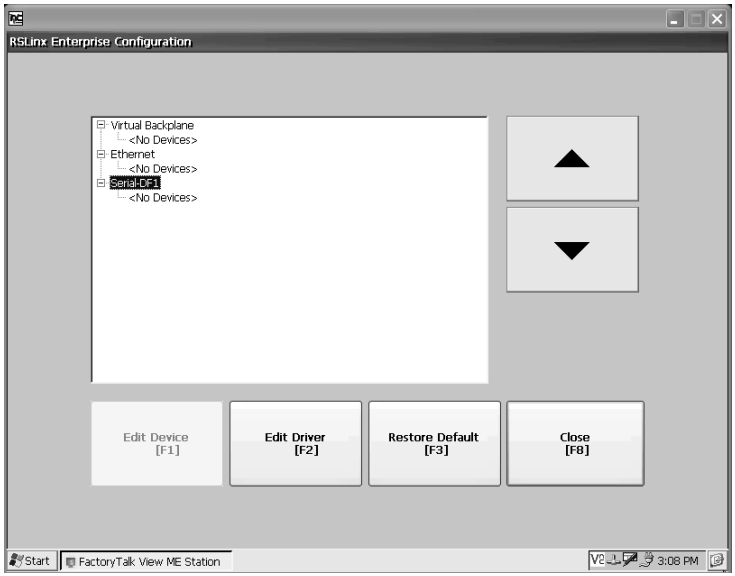
If you are using a serial connection for the transfer, specify and set up the driver.

You can also transfer applications to the terminal using a Flash Card. For information about this method, see the *PanelView Plus Terminals User Manual*.

To specify and set up a serial driver for the transfer

1. In the FactoryTalk View ME Station dialog box, click Terminal Settings.

2. Double-click Networks and Communications.
3. In the Networks and Communications dialog box, double-click RSLinx Enterprise Communications.



4. Click the Serial-DF1 driver, and then click Edit Driver.
5. Select Use Auto-Configuration, and then click Edit.
6. In the dialog box that opens, select Yes, and then click OK.

   Auto configuration works with most devices, including Logix5000 and PLC-5®. If auto configuration is not successful for your device, return to these steps, select No, and continue to step 7.
7. Set up the driver, and then click OK. If you are using auto configuration, skip this step.

Setting up a driver for the transfer on the development computer

On the development computer, set up the RSLinx Enterprise driver that you will use to download your application to the PanelView Plus CE, PanelView Plus or PanelView Plus 6 terminal.

Use one of these drivers for the transfer:

- Serial-DF1—Use for a serial transfer.

- Ethernet—Use with an Ethernet connection.

For information about setting up drivers in RSLinx Enterprise, see RSLinx Help.

Downloading applications and Windows TrueType fonts

Use the Transfer Utility to download your run-time application and Windows TrueType font files from the development computer to the PanelView Plus or PanelView Plus CE terminal.

Run-time applications have the extension .mer. Windows TrueType font files have the extension .ttf or .ttc.

For information about creating the run-time application file, see Chapter 14.

About the download

You can use a serial or Ethernet connection between the development computer and the PanelView Plus or PanelView Plus CE terminal destination. You must use one of the drivers listed in the previous section for the download.

You can download while an application is running on the run-time computer.

You can download:

- multiple applications (one at a time) to the same run-time computer.
- a new copy of the application currently running on the run-time computer, for use the next time the application is started.

If the download process fails or is cancelled, the application file will be deleted from the destination directories. Make a copy of the application file before you begin and make sure there is enough storage space on the destination computer.

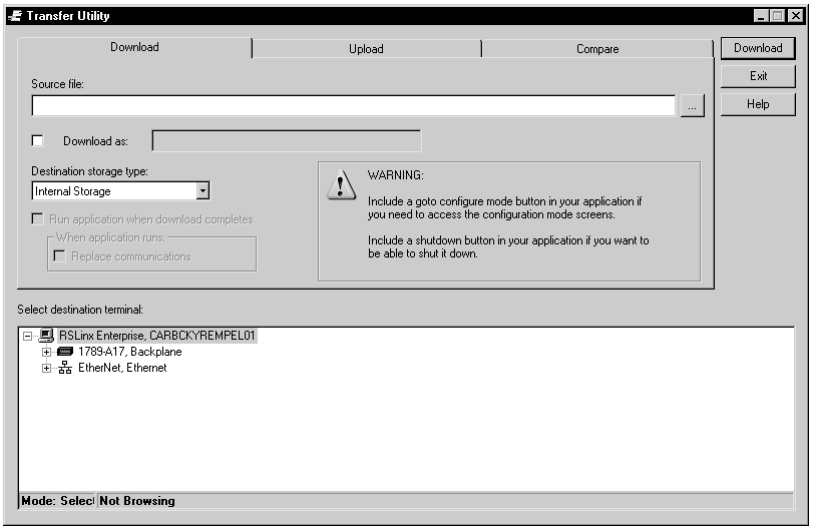
Serial downloads

To perform a serial download, make sure the terminal is connected to the development computer using the correct cable. Connect a PanelView Plus CE, PanelView Plus or PanelView Plus 6 terminal to the PC using the Allen-Bradley® serial cable 2711-NC13.

To start the Transfer Utility tool

On the development computer, do one of the following:

- In FactoryTalk View Studio, on the Tools menu, click Transfer Utility.
- On the Windows Start menu, select Programs > Rockwell Software > FactoryTalk View > Tools, and then click ME Transfer Utility.



For details about using the utility, see the utility's Help.

Uploading applications from the PanelView Plus CE, PanelView Plus or PanelView Plus 6 terminal

Use the Transfer Utility to upload your run-time application from the PanelView Plus CE, PanelView Plus or PanelView Plus 6 terminal to the development computer. Run-time applications have the extension .mer.

Any password changes that were made while the application was running are saved in the .mer file and will be uploaded.

If the upload process fails or is cancelled, the application file will be deleted from the destination directory. Make sure there is enough storage space on the destination computer.

About the upload

You can upload while an application is running on the run-time computer. You can upload an existing copy of the application currently running on the run-time computer.

Serial uploads

To perform a serial upload, make sure the terminal is connected to the development computer using the correct cable. Connect a PanelView Plus CE, PanelView Plus or PanelView Plus 6 terminal to the PC using the Allen-Bradley serial cable 2711-NC13.

For details about performing the upload, see Help for the Transfer Utility.

Comparing applications

You can also use the Transfer Utility tool to compare an application on the development computer with an application on the terminal. The comparison tool can tell you whether the files are identical or different. The comparison tool detects differences using a binary checksum. It is not possible to list individual differences between the files.

17 Using your application

This chapter describes:

- logging in and logging out.
- changing passwords.
- entering numeric and string values.
- changing tag values.
- viewing tag data.
- viewing alarms and messages.
- viewing information about run-time communication errors.
- changing languages.

For information about navigating between displays, see Chapter 13. For information about navigating between and using the graphic objects in a display, see page 21-4.

Logging in to a Windows domain

To log data to a network location, the run-time computer must be logged in to the same domain as the computer on the network. To do this, the user must have access rights for the domain.

To log in to a domain from a personal computer

- When Windows® starts, type a user name, password, and domain name.

The PanelView™ Plus 6, PanelView™ Plus or PanelView™ Plus CE terminals can be part of a domain by being added as a “computer”. This is necessary for authentication and attaching to a network resource. For more information, see Answer ID 65603 in the Rockwell Automation Knowledgebase.

On the PanelView Plus 6, PanelView Plus or PanelView Plus CE terminal, logging in caches the user credentials. This gives the terminal access to permissible network resources such as network folders.

To authenticate a user on a PanelView Plus 6. PanelView Plus or PanelView Plus CE terminal

1. In the FactoryTalk® View ME Station dialog box, click Terminal Settings.
2. Double-click Networks and Communications.

3. Double-click Network Connections.
4. Double-click Network Identification.
5. Type a user name, password, and domain name, and then click OK.

Logging in to the application

Users log in using the Login window. They must have a user account in order to log in.

For information about setting up user accounts and passwords, see Chapter 11.

4.00 and later applications

To log in, the user must have an account in the Runtime Security editor, in the ME Runtime 4.00 and later tab. The user must have a password, which is set up in FactoryTalk Security, using the Users folder. For details, see Chapter 11.

Passwords are case sensitive.

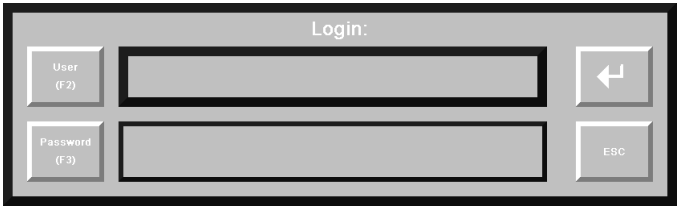
3.20 and earlier applications

To log in, the user must have an account in the Runtime Security editor, in the ME Runtime 3.20 and earlier tab. User passwords are optional in RSView® 3.20 and earlier. If you use them, they are not case sensitive.

To log in

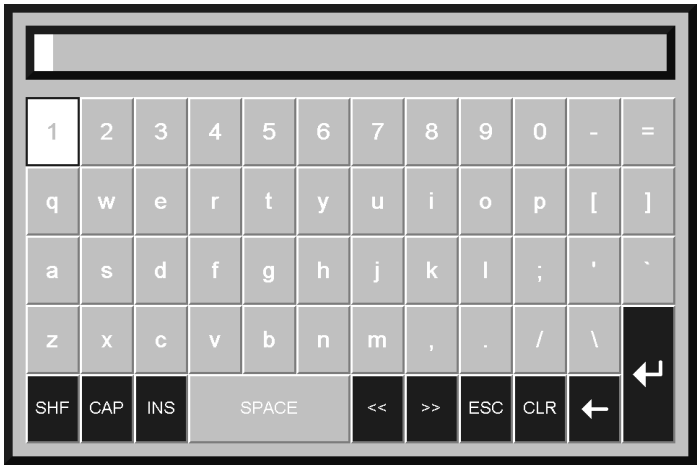
1. Press the login button.

   The Login window opens.



2. Press the User button, or press F2 on an external keyboard.

   The string pop-up keyboard opens. For details about using the keyboard, see page 17-11.



3. Type your user name in the string pop-up keyboard, or on an external keyboard, and then press Enter.

   For FactoryTalk View 5.00 and later applications and for RSView 4.00 applications, the name is not case sensitive. For RSView 3.20 and earlier applications, the name must use ALL CAPS.

4. To enter a password, press the Password button, or press F3 on an external keyboard.

5. Type the password in the string pop-up keyboard, or on an external keyboard, and then press Enter.

   For FactoryTalk View 5.00 and later applications and for RSView 4.00 applications, the password is case sensitive. For RSView 3.20 and earlier applications, the password is not case sensitive.

6. To close the Login window and complete the login, press Enter.

What happens when a user logs in

When a user logs in:

- If the previous user did not log out, the previous user is logged out now. If a logout macro is set up for the previous user, the logout macro runs, assigning values to tags. If the previous user belongs to a group, and a logout macro is set up for the group, the logout macro runs.
- The new user is logged in.

- If a login macro is set up for the new user, the macro runs, assigning values to tags. If the new user belongs to a group, and a login macro is set up for the group, the login macro runs.

Problems with logging in

Login is unsuccessful under these circumstances:

- If the graphic display changes remotely before the user has finished logging in, the login is cancelled.
- If the user name doesn't match the settings in the Runtime Security editor, the user is not logged in.
- If the user password doesn't match the password set up in FactoryTalk Security, in the Users folder (4.00 or later applications), or the password set up in the Runtime Security editor (for 3.20 and earlier applications), the user is not logged in.
- If the screen resolution is smaller than 280 pixels wide by 84 pixels high, the Login window cannot open.
- If the screen resolution is smaller than 236 pixels wide by 208 pixels high, the string pop-up keyboard cannot open.

Changing passwords

You can use the password button to change your password at run time. Any password changes that are made at run time are saved in the .mer file.

When passwords are changed at run time, be sure to change the passwords on the development computer as well. Otherwise, the next time you create the .mer file the password changes will be lost. For version 5.00 and later applications, you can convert the run-time application file to a development application in order to save password changes. For more information, see page 14-7.

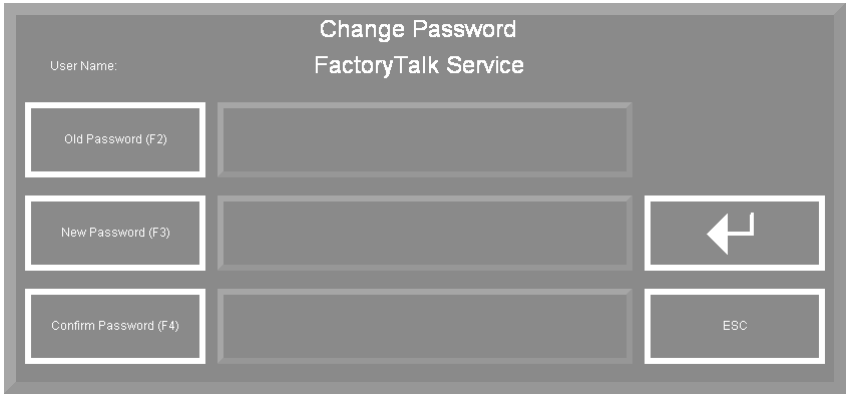
If you are logged in to Windows as an Administrator user, you can use the password button to change passwords for Windows-linked users. If you are not logged in as an Administrator user, or if your application is running in Windows CE, the passwords for Windows-linked users must be changed in Windows.

For version 3.20 and earlier applications, you cannot change passwords in FactoryTalk View ME Station. To change a password for a FactoryTalk View user, use the Runtime Security editor in FactoryTalk View Studio, then recreate the run-time application and download the .mer file again. To change a password for a Windows user, use the Windows Control Panel.

To change your password

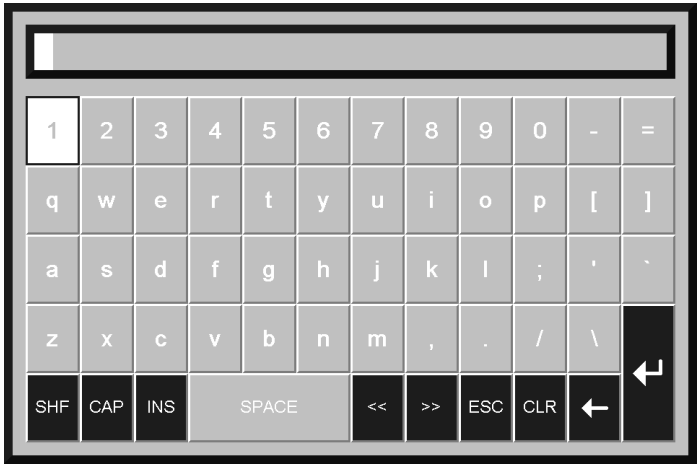
1. Press the password button.

   The Change Password window opens.



2. Press the Old Password button, or press F2 on an external keyboard.

   The string pop-up keyboard opens. For details about using the keyboard, see page 17-11.



3. Type your old password in the string pop-up keyboard, or on an external keyboard, and then press Enter.

   The password is case sensitive.

4. Press the New Password button, or press F3 on an external keyboard.
5. Type the new password in the string pop-up keyboard, or on an external keyboard, and then press Enter.
6. Press the Confirm Password button, or press F4 on an external keyboard.
7. Type the new password again, and then press Enter.
8. To close the Change Password window and complete the change, press Enter.

Logging out

When the current user logs out, if a logout macro is assigned to the user, the macro runs. If the user belongs to a group, and a logout macro is set up for the group, the logout macro runs.

After the current user is logged out, the DEFAULT user is logged in. If a login macro is assigned to the DEFAULT user, the macro runs.

You can also set up the application to automatically log out the current user after a specified period of inactivity. For more information, see page 11-13.

To log out

- Press the logout button.

Entering numeric values

The operator can enter or ramp numeric values at run time using the numeric input enable button or the numeric input cursor point.

When the operator presses the button or activates the cursor point, the numeric pop-up keypad or scratchpad opens. If you set up the button or cursor point to ramp, pressing the object gives it focus, but does not open a pop-up window.

To use the numeric pop-up scratchpad, a keyboard must be attached to the run-time computer, or the terminal must be a keypad terminal.

For information about setting up the numeric input enable button and numeric input cursor point, see Help.

You can also use a ramp button to ramp numeric values. For details, see Help for the button.

Activating the cursor point

When the numeric input cursor point has focus, the operator can activate the cursor point by pressing any of these keys on the keyboard or keypad:

- numbers from 0 to 9
- the minus sign (-) or decimal point (.)
- the Enter key, or an enter button
- the Backspace key, or a backspace button

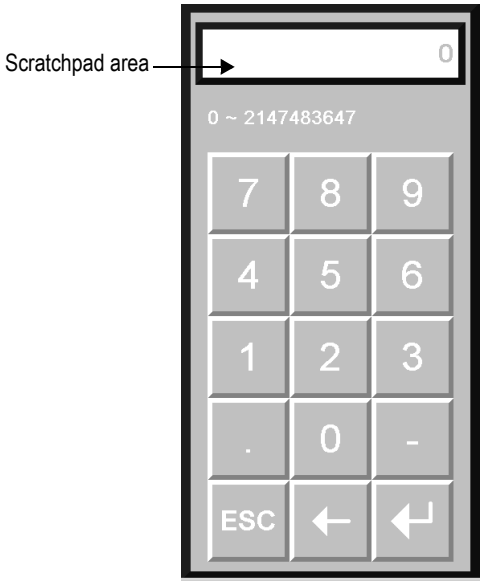
When the operator activates the numeric input cursor point, the numeric pop-up keypad or scratchpad opens.

Ramping numeric values

If you set up the numeric input enable button or numeric input cursor point to ramp values, the operator presses the object to give it focus. When the object has focus, the operator can press a move up or move down button, or the Up Arrow or Down Arrow key on a keyboard or keypad, to ramp the value at the Value connection.

Using the numeric pop-up keypad

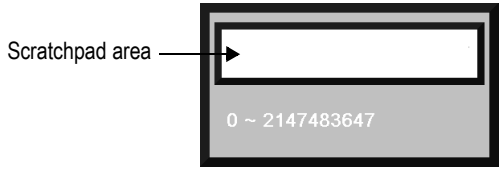
The keypad can accept up to 17 digits, including the decimal point, leading zero, and minus sign.



When the keypad is open, no other objects in the graphic display can accept input.

Using the numeric pop-up scratchpad

The scratchpad can accept up to 17 digits, including the decimal point, leading zero, and minus sign.



The scratchpad does not contain any buttons. If the run-time computer does not have an external keyboard or keypad attached, the operator will be unable to enter values or close the scratchpad.

When the scratchpad is open, no other objects in the graphic display can accept input.

Using buttons and keys with the numeric pop-up windows

You can use the following buttons and their keyboard or keypad equivalents with the numeric pop-up keypad. For the pop-up scratchpad, you can use the keys on an external keyboard or keypad only.

Use this button or key	To do this
Decimal (.)	Type a decimal point. This button is visible only if the decimal point type for the numeric input enable button or numeric input cursor point is Implicit.
Minus (-)	Toggle the value between positive and negative.
ESC	Close the pop-up window without writing the value to the object's Value connection.
Backspace	Delete the right-most digit in the scratchpad. If no digits are left, the minus sign, if any, is removed.
Enter	Close the pop-up window and write the value to the object's Value connection. If the Optional Expression connection is assigned to the button or cursor point, FactoryTalk View calculates the value of the expression and writes the result to the Value connection. For details, see page 23-18. If Enter key handshaking is set up for the button or cursor point, the object's Enter connection is set to 1 and the handshaking timer begins timing. For details, see page 21-12.

Use this button or key	To do this
Delete	Clear the scratchpad. There is no Delete button in the pop-up keypad, but you can use the Delete key on an external keyboard or keypad.

How values are ramped

If the button or cursor point is being used to ramp a value at the Value connection:

- When the tag assigned to the Value connection is an integer tag, but the ramp value is a floating point value, the ramp value is added to (or subtracted from) the Value connection value, and then the result is rounded and written to the Value connection.

  For information about how values are rounded, see page 7-2.

- If the operator presses and holds down the move up or move down button, or the Up Arrow or Down Arrow key on the keyboard or keypad, the button or key goes into auto repeat mode. The ramp value is added to (or subtracted from) the last value sent to the Value connection.

  For more information about auto repeat mode, see page 21-12.

- If ramping the button or cursor point would cause the value at the Value connection to exceed the maximum value, or be less than the minimum value, a message is written to the Diagnostics List and the value at the Value connection is not changed.

How values are calculated

When the pop-up keypad or scratchpad has focus and the operator presses the Enter button, the value that is sent to the Value connection depends on how the button or cursor point is set up.

- The value the operator enters is compared to the minimum and maximum range for the object. If the value is within the range, the value is written to the Value connection.

  If the Optional Expression connection is assigned, and the original value is within the range but the expression result is a value outside the range, the value is still written to the Value connection.

- If the decimal point type is Fixed Position, with a “Digits after decimal” value that is greater than 0, the decimal point is stripped from the value before comparing it to the minimum and maximum range.

  For example, if the entered value is 9.25, the stripped value is 925.

  If the stripped value is within the range, the stripped value is sent to the Value connection (or substituted for the ? in the Optional Expression).

- If the decimal point type is Implicit, and the tag assigned to the Value connection uses an integer data type, floating-point values are rounded.

  If the Optional Expression connection is assigned, the floating-point value is substituted for the ? in the expression, and the expression result is rounded.

  For information about how values are rounded, see page 7-2.

Problems with the numeric pop-up windows

Problems with the numeric pop-up keypad and scratchpad occur under these circumstances:

- If the graphic display changes remotely before the user has pressed the Enter button, the pop-up window closes without writing out a value.
- If the screen resolution is smaller than 124 pixels wide by 240 pixels high, the pop-up keypad cannot open.
- If the screen resolution is smaller than 124 pixels wide by 68 pixels high, the pop-up scratchpad cannot open.
- If the value is too large for the data type of the tag assigned to the Value connection, the pop-up window remains open and the value is not written to the connection. The scratchpad area changes to red to alert the operator of the error.
- If the value is outside the minimum and maximum range specified for the object, the pop-up window remains open and the value is not written to the connection. The scratchpad area changes to red to alert the operator of the error.
- If Enter key handshaking is still in effect, the pop-up window closes but the value is not written to the connection.

Entering string values

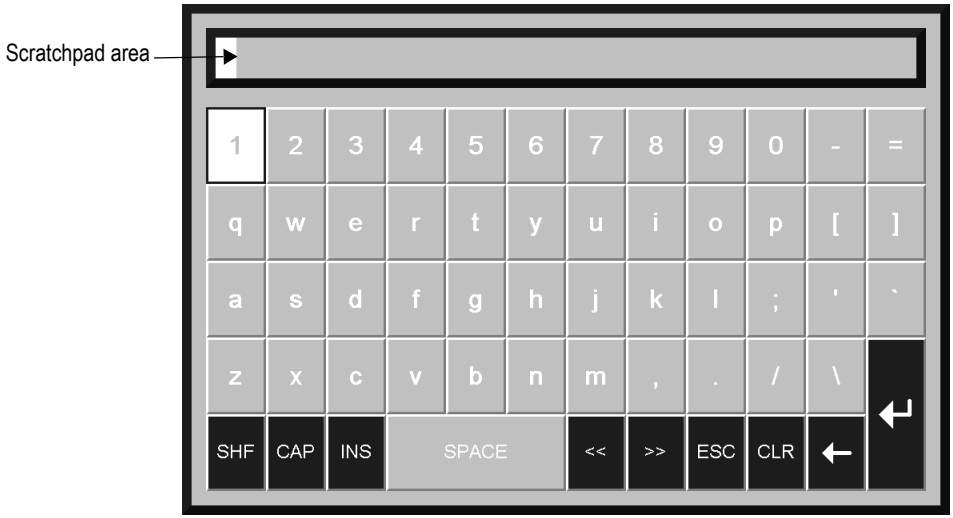
The operator can enter string values at run time using the string input enable button.

When the operator presses the button, the string pop-up keyboard or scratchpad opens, depending on how you set up the button. To use the scratchpad, a keyboard must be attached to the run-time computer.

For information about setting up the string input enable button, see Help.

Using the string pop-up keyboard

The string pop-up keyboard opens when the operator presses a string input enable button or the User or Password button in the Login dialog box. The pop-up is also used with the password button graphic object.



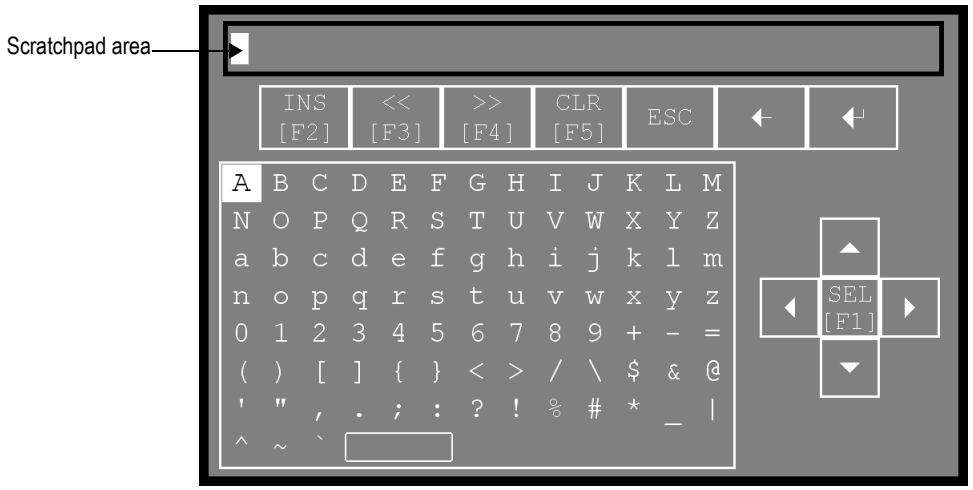
If the operator opens the pop-up keyboard by pressing a string input enable button, the number of characters the keyboard accepts depends on how you set up the button.

When the keyboard is open, no other objects in the graphic display can accept input.

Using the string pop-up character input

You can use a string pop-up character input instead of the string pop-up keyboard. With the string pop-up character input, you use the arrow keys to select the characters to input.

The string pop-up character input opens when the operator presses a string input enable button or the User or Password button in the Login dialog box. The pop-up is also used with the password button graphic object.



If the operator opens the string pop-up character input by pressing a string input enable button, the number of characters the input accepts depends on how you set up the button.

To use the string pop-up character input on a personal computer

1. In FactoryTalk View Studio, on the Tools menu, select Options.
2. Click the String Pop-Up tab.
3. Select Use the string pop-up character input.

To use the string pop-up character input on a PanelView Plus 6. PanelView Plus or PanelView Plus CE terminal

1. In FactoryTalk View ME Station, click Terminal Settings.
2. Double-click Input Devices.
3. Select String Pop-Up, and then click Enter.
4. Specify whether to invoke the pop-up character input instead of the pop-up keyboard, and then click OK.

Using the string pop-up scratchpad

If the operator opens the string pop-up scratchpad by pressing a string input enable button, the number of characters the scratchpad accepts depends on how you set up the string input enable button.

The scratchpad does not contain any buttons. If the run-time computer does not have an external keyboard attached, the operator will be unable to enter characters or close the scratchpad (unless the run-time terminal is a keypad terminal). If the run-time terminal is a keypad terminal, the operator can enter numbers (not letters) in the scratchpad, and close the scratchpad.

When the scratchpad is open, no other objects in the graphic display can accept input.

Using buttons and keys with the string pop-up windows

You can use the following buttons and their keyboard equivalents with the string pop-up keyboard. For the pop-up scratchpad, you can use the keys on an external keyboard only. The string pop-up character input doesn't have a SHF or CAP key, and it has additional arrow keys for selecting the characters to input.

Use this pop-up keyboard button	Or this keyboard equivalent	To do this
SHF	none	Capitalize a single letter, or type a shifted character such as #.
CAP	none	Capitalize multiple letters.
INS	Insert	Toggle between insert and overstrike modes.
SPACE	Spacebar	Insert a space.
<<	Left Arrow	Move the cursor to the left.
>>	Right Arrow	Move the cursor to the right.
ESC	Esc	Close the pop-up window without writing the string to the Login dialog box, the Change Password dialog box, or the string input enable button's Value connection.
CLR	Delete	Clear the scratchpad.

Use this pop-up keyboard button	Or this keyboard equivalent	To do this
Backspace	Backspace	Delete the character in front of the cursor.
Enter	Enter	Close the pop-up window and write the string to the Login dialog box, the Change Password dialog box, or the string input enable button's Value connection. If Enter key handshaking is set up for the string input enable button, the button's Enter connection is set to 1 and the handshaking timer begins timing. For details, see page 21-12.

What is written to the Value connection

When the operator presses the Enter button in the pop-up keyboard or scratchpad, the string that is sent to the Value connection depends on how the string input enable button is set up.

- If a fill character is set up for the button, and the operator enters fewer than the maximum number of input characters, the fill characters are placed after the string the operator enters.
  - Spaces have a hex value of 20.
  - Zeroes have a hex value of 30.
  - FF characters have a hex value of FF.
  - Null characters have a hex value of 0. The null character indicates the end of string input. It does not add to the actual string length.
- If the number of input characters is fewer than the number of characters in the length of the string tag assigned to the Value connection, the remaining spaces are padded with the null character.

When the string is written to the Value connection, the first character is placed in the high order byte of the first word at the tag address, the second character is placed in the low order byte of the first word, and so on.

Problems with the string pop-up windows

Problems with the string pop-up keyboard and scratchpad occur under these circumstances:

- If the graphic display changes remotely before the user has pressed the Enter button, the pop-up window closes without writing out a string.
- If the screen resolution is smaller than 236 pixels wide by 208 pixels high, the pop-up keyboard cannot open.
- If the screen resolution is smaller than 236 pixels wide by 44 pixels high, the pop-up scratchpad cannot open.
- If the string pop-up window is set up to accept more characters than the Value connection tag length, the pop-up window remains open and the string is not written to the connection. The scratchpad area changes to red to alert the operator of the error.
- If Enter key handshaking is still in effect, the pop-up window closes but the value is not written to the connection.

Changing tag values

This section gives an overview of the graphic objects you can use to change tag values. For information about setting up the objects, see Chapter 21 and Help.

The operator uses these objects to start and stop plant operations, and to control machines and processes. Choose the objects that best suit your process. Set up the data source to carry out the desired actions in response to the changes in tag values.

The operator can use function keys with all of these objects except control list selectors, third-party ActiveX® objects, and drawing objects with slider animation. The last three types of objects can be pressed using a mouse or touch screen.

For information about assigning function keys to graphic objects, see page 21-5.

Do not use push buttons for emergency stops. Emergency stop buttons must be hard-wired.

You can also use macros to assign values to tags. For more information, see Chapter 30.

The operator can change tag values at run time using these graphic objects:

Use this graphic object	To do this
Momentary push button	Start a process or action by sending one value to the tag when pressed, and another value when released.

Use this graphic object	To do this
Maintained push button	Toggle between two values by sending one value to the tag when pressed, and a second value the next time the button is pressed and released. This button is useful for changing a setting within a machine or process, but not for starting the machine or process.
Latched push button	Start a machine or process and remain set (latched) until the process is completed, by sending a value to the tag when pressed, and retaining this value until reset (unlatched) by the Handshake connection.
Multistate push button	Cycle through a series of values. Each time the operator presses the button, the value for the next state is sent to the tag. When the button is in its last state, pressing it causes the button to change to its first state and write out the first state value. This button is useful when you want the operator to see and select multiple options in sequence, using a single button. The button displays the current state of a process or operation by showing a different color, caption, or image to reflect the different states.
Interlocked push button	Use a group of buttons to send values to the same tag. When the operator presses a button in the group, the button's value is sent to the tag, and the button remains highlighted as long as the tag value is the same as the button's value. Pressing a new button in the group releases the other button and sends a new value to the tag. You can also use a single interlocked push button to send a value to a tag.
Ramp button	Increase or decrease the value of a tag by a specified integer or floating-point value. Use two ramp buttons together to create a raise/lower control.
Numeric input enable button	Enter a numeric value and write the value to a tag. You can also use this object to ramp values.
Numeric input cursor point	Enter a numeric value and write the value to a tag. You can also use this object to ramp values.
String input enable button	Enter a string value and write the value to a tag.
RecipePlus button	Write values for all the ingredients in the selected recipe to a set of tags. The button works with the RecipePlus table and RecipePlus selector graphic objects.

Use this graphic object	To do this
Drawing object with horizontal or vertical slider animation	Control the value of a tag by dragging the slider object with a mouse. The pixel position of the slider is translated into a value that is written to the tag. If the value of the tag is changed externally, the position of the slider changes to reflect this.
Control list selector	Select from a list of states for a process or operation. The list is highlighted to show the current state, and the operator can scroll through the list to select a different state. The value assigned to the selected state is written to the tag. If the value of the tag is changed externally, the position of the highlight changes to reflect this.
ActiveX object	A third-party object, connected to an analog, digital, or string tag, including both HMI and data server tags. When the object's property value changes, the new value is written to the associated tag.

You can attach visibility animation to these graphic objects, to display or hide the objects based on changes in tag or expression values. For information about visibility animation, see page 22-9.

For information about creating graphic objects, see Chapter 20. For information about setting up graphic objects, see Chapter 21 and Help.

Viewing tag data

This section gives an overview of the graphic objects you can use to display tag data. For information about setting up the objects, see Chapter 21 and Help.

The operator can view tag data at run time using these graphic objects:

Use this graphic object	To display this
Numeric display	Numeric tag values. For example, display the current temperature of an oven.
Numeric input cursor point	Numeric tag values. For example, display the current temperature of an oven.
String display	String tag values. For example, set up the data source to generate strings that report on the state of a process or operation, or that provide the operator with instructions about what to do next.

Use this graphic object	To display this
Bar graph	Numeric values in bar graph format. The bar graph increases or decreases in size to show the changing value.
Gauge	Numeric values in dial format. The gauge's needle moves around the dial to show the changing value.
Multistate indicator	The state of a process, on a panel that changes its color, image, or caption to indicate the current state. Each state is set up to correspond to a numeric tag value or least significant bit.
Symbol	The state of a process, using a monochrome image that changes color to indicate the current state. Each state is set up to correspond to a numeric tag value or least significant bit. This object is useful for showing the state of a process or operation at a glance.
List indicator	The state of a process, using a list of possible states with the current state highlighted. Each state is represented by a caption in the list, and is set up to correspond to a numeric tag value or least significant bit. This indicator is useful if you want to view the current state but also want to see the other possible states. For sequential processes, the list can alert the operator about what happens next in the process.
Trend	Historical or current numeric tag values, plotted against time or displayed in an XY plot where one or more tags' values are plotted against another tag's values to show the relationship between them.
RecipePlus table	Current tag values and data set values of the ingredients in the selected recipe, and the number of ingredients in the recipe. The table works with the RecipePlus button and RecipePlus selector graphic objects.
Drawing object with rotation, width, height, fill, color, or horizontal or vertical position animation	Display the value of a tag using a pictorial representation that shows the current value in relation to a range of possible values. For example, use rotation animation to show the tag value as a needle's position on a dial. For color animation, assign different colors to represent different values.
ActiveX object	A third-party object, connected to an analog, digital, or string tag, including both HMI and data server tags. The data displayed depends on the object.

Many of these objects can be set up to manipulate tag values using expressions, and display the expression result rather than the original tag value. For information about expressions, see Chapter 23.

You can also attach visibility animation to these graphic objects, to display or hide the objects based on changes in tag or expression values. For information about visibility animation, see page 22-9.

For information about creating graphic objects, see Chapter 20. For information about setting up graphic objects, see Chapter 21 or Help.

Displaying the date and time

To display the current date and time, create a time and date display. This object uses the operating system's date and time, in the format of the application's current language, and therefore does not require tags or expressions.

Viewing alarms and messages

The operator can view alarms and other messages at run time using these graphic objects and graphic displays:

This information	Appears in this object	In this default graphic display	For details, see
Alarm messages	Alarm banner	[ALARM].	page 9-26
Alarm messages	Alarm list	No default, although this object appears in the [ALARM MULTI-LINE] and [HISTORY] graphic libraries.	page 9-25, page 9-27, and page 9-29
Alarm messages	Alarm status list	No default, although this object appears in the [STATUS] graphic library.	page 9-28
System activity	Diagnostics list	[DIAGNOSTICS]	page 10-12
Information messages	Information message display	[INFORMATION]	page 27-7
Local messages	Local message display	No default.	page 19-30

The default alarm and information displays open automatically when the assigned tags match messages' trigger values. The default diagnostics display opens automatically when system activity occurs. If desired, you can set up your own graphic displays to open automatically, instead of the default displays. You can also set up any of the displays to open when an operator presses a goto display button or selects a display in the display list selector.

The operator can acknowledge alarm and information messages. The operator can clear alarm and diagnostics messages. The operator can sort alarms and reset their status.

Viewing information about run-time communication errors

To display communication errors in the diagnostics list object, set up message routing so that messages are sent to the FactoryTalk View Diagnostics List.

For information about setting up diagnostics message routing, see Chapter 10.

Changing languages

You can change languages at run time. The languages available depend on what has been set up for the run-time application. There is a separate language switch button for each language that you can change to.

For information about setting up language switching, see Chapter 12.

To change languages

- Press a language switch button.

  Text strings in the application change to the language specified by the button.

18 Working with components

This chapter describes:

- which editors have components.
- working with components.
- printing information in components.

For information on working with particular editors, see the chapters later in this guide.

Editors that have components

With some editors you enter information in a single window or a tabbed dialog box. Other editors allow you to create multiple components, such as graphic displays or message files. Each component is stored in a separate file, with its own name.

You can create components in these editors:

- Graphics (components include graphic displays, global object displays, and graphic libraries, each in their own folder)
- Parameters
- Local Messages
- Information Messages
- Data Log Models
- Macros
- RecipePlus

The Explorer window lists the components you create under the icon for the editor you used to create the component.

You can use the Images editor to copy bitmap images into your application (but not to create new images). Each image you copy is listed as a component under the editor.

To view a list of components for an editor

- Click the + symbol to the left of the editor icon, or double-click the editor name.

Working with components

This section describes how to perform basic operations that are common to all components.

For information on working with components in particular editors, see the chapters later in this guide.

Creating components

To create a new component, do one of the following

- Drag the component icon into the workspace.
- Right-click the editor, and then click New.
- On the File menu, select New, and then click the type of component to create.

Opening components

To open a component, do one of the following

- Double-click the component.
- Right-click the component, and then click Open.
- Drag the component from the Explorer window to the workspace.

Saving components

The Save tool is available when the active component contains unsaved changes.

To save a component

Save tool

1. On the File menu, click Save, or click the Save tool.

2. If this is the first time you're saving the component, type a name in the Component name box, and then click OK.

Close button on the title bar

Closing components

To close a component

Close button in component

- On the File menu, click Close, or click the Close button on the component's title bar.

  Some components have a Close button that you can click to close the component.

Before the component closes you are prompted to save unsaved changes, if there are any.

Adding components into an application

You can use the same components in more than one application by adding components into an application.

For example, if you want to use the same graphic display in Application A and Application B, create the display in Application A, then add the graphic display component from Application A to Application B.

When you add the component into Application B, changes you make to the component in Application B are not reflected in the component in Application A.

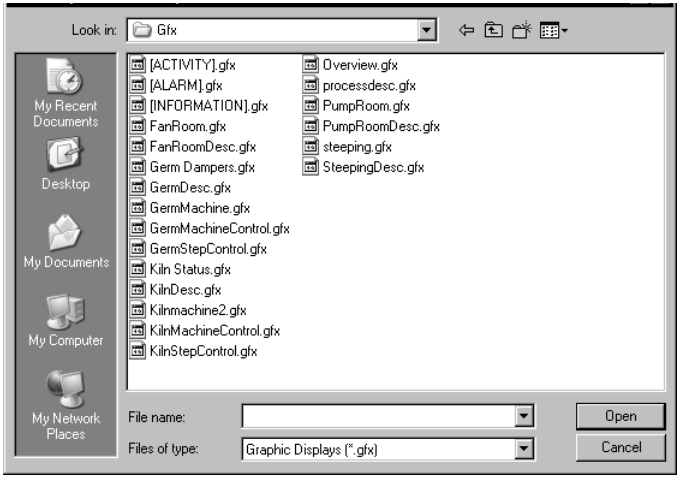
All the language strings associated with the component in Application A are copied into Application B. For example, if you add an information message file for which three sets of language strings have been defined, all three sets of strings are copied into Application B, regardless of which languages have been set up for Application B. For more information about using multiple languages, see Chapter 12.

To add a component from Application A into Application B

1. In Application B, right-click the type of editor that was used to create the desired component.

   For example, to add a graphic display component, right-click the Displays icon in the Graphics folder.

2. Click Add Component Into Application.



3. In the dialog box, navigate to the component to add (in Application A's folder), and then click the component's file name.

   Click and Shift-click to select a group of components, or Ctrl-click to select multiple individual components.

   For information about application folders and files, see Chapter 4.

4. Click Open. The components are listed under the editor in the Explorer window in Application B.

If you later modify the component in Application A, you can add the component into Application B again using the same steps as described above.

Using Add Component Into Application with graphic displays, graphic libraries, and global object displays

The Add Component Into Application menu command is also useful for:

- adding graphic displays to your application's Libraries folder.
- using libraries as graphic displays in your application.
- moving libraries into the Displays folder so you can export their strings for translation.
- creating global object displays.

For information about graphic libraries, see page 19-14. For information about global object displays, see page 25-11.

Deleting components

Deleting a component deletes it from the Explorer window and from the hard disk.

To delete a component

- Right-click the component, and then click Delete.

Removing components

You can remove a component from the Explorer window but leave it on the hard disk, in case you want to use the component in another application.

To remove a component

- Right-click the component, and then click Remove.

Renaming components

To rename a component

1. Right-click the component, and then click Rename.

2. In the To box, type the new name.
3. Click OK.

Duplicating components

The Duplicate option is useful for creating multiple similar components. For example, you could create a graphic display to use as a template, then duplicate the display each time you want to use the template.

To duplicate a component

1. Right-click the component, and then click Duplicate.
2. In the Component name box, type a name for the duplicate component.
3. Click OK.

Printing

Each component has a Print item on its File menu.

To print a component's contents

1. Open the component.
2. On the File menu, click Print.
3. Click OK.

For information about selecting a printer and printing at run time, see page 2-13.

19 Using graphic displays

This chapter describes the Graphics, Images, and Local Messages editors in the Graphics folder and outlines how to:

- use the Graphics editor.
- set up graphic displays.
- create a background for your displays.
- use graphic libraries.
- import graphic images.
- create local messages in your displays.
- print graphic displays at run time.

Before creating graphic displays, specify project settings. Project settings determine important aspects of your graphic display such as size and position. For more information, see page 4-11.

For information about global object displays and the Parameters editor, see Chapter 25.

About graphic displays and graphic objects

A graphic display represents the operator's view of plant activity. The display can show system or process data and provide operators with a way to write values to an external data source. The data source can be memory or a device such as a programmable controller or an OPC® server.

Operators can print the display at run time to create a visual record of tag values, object states, or current messages.

The elements that make up a graphic display are called graphic objects. You can create objects in the Graphics editor, or copy them from a global object display, from a graphic library, or from another application.

For information about creating and copying graphic objects, see Chapter 20.

You can use up to 1,000 tags per graphic display. This limit includes the tags contained in embedded variables.

Compact applications (applications running on PanelView Plus Compact terminals) have a limited number of displays.

Before you begin

Before you begin, plan your displays. Think about what information the operator needs to see, and the best way to provide the information. For example:

- Does the operator need to know the exact speed of a conveyor belt, or just whether the belt is moving, jammed, or stopped?
- Do different users need to have access to different types of information?
- Do you need to limit access to certain types of information?

Also consider the run-time environment and how the operator will use the application:

- Does the run-time computer have a touch screen, mouse, keyboard, or some combination of these?
- How will the operator navigate through the displays of the application?
- Will the application be available in multiple languages?

Review the chapters on planning, security, and navigation before you begin creating displays. Browse through the sample applications for design ideas. Map out a display hierarchy. Then create a graphic display to use as a template.

The time you spend planning your displays will make your application easy to use and will save you time in the long run.

For information about	See
Planning your displays and creating a template	Chapter 3
Setting up application security to control access to displays	Chapter 11
Setting up display navigation and creating a display hierarchy	Chapter 13
Setting up how objects are used at run time	Chapter 21

Using the Graphics editor

The Graphics editor opens when you create or open a graphic display, global object display, or graphic library. Each display is stored in the Displays folder. You can open and work on multiple graphic displays at the same time.

Creating and opening graphic displays

To create a graphic display

1. In the Graphics folder, do one of the following:
   - right-click Displays and then click New.
   - click the New Display tool.
   - drag and drop the Displays icon into the workspace.

New Display tool

2. On the Edit menu, click Display Settings to open the Display Settings dialog box and specify settings for the display.

   For more information, see page 19-11.

3. Create the objects you want to put in the display.

   For information about creating graphic objects, see Chapter 20.

Save tool

4. On the File menu click Save, or click the Save tool.
5. In the Component name box, type a name for the display, and then click OK.

   The display is added to the list in the Displays folder.

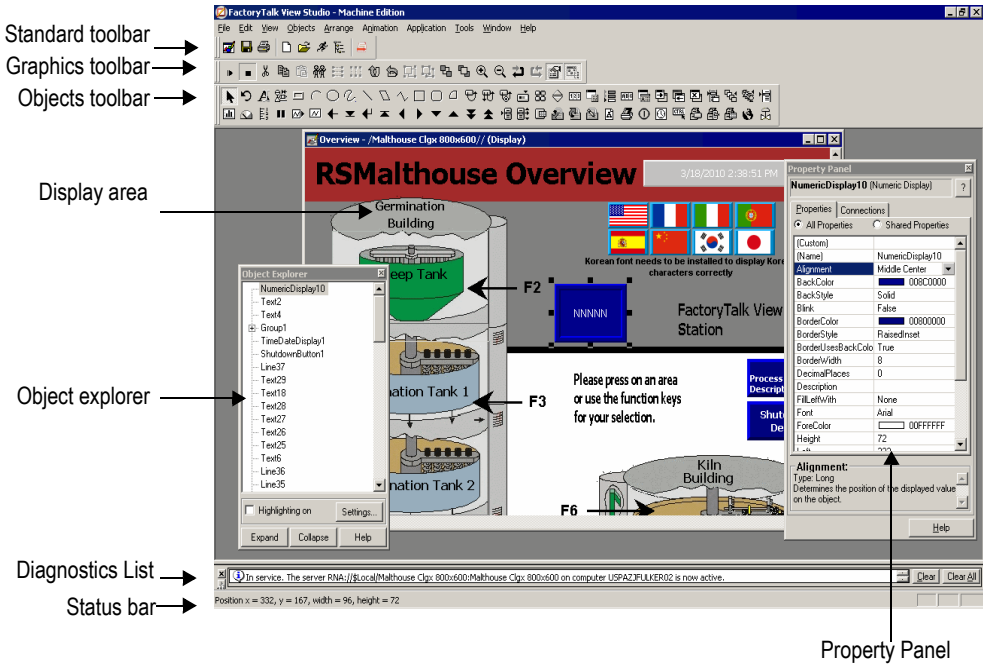
   The display is created as a Replace display by default, but you can change it to an On Top display in the Display Settings dialog box. For more information about display types, see page 19-12.

To open a graphic display

- In the Graphics folder, open the Displays folder and then double-click the display name, or right-click the display name and then click Open.

  You can also drag and drop the display from the Explorer window to an empty area in the FactoryTalk® View Studio workspace.

  This example shows a graphic display with the Explorer window closed.



The Graphics editor has special items on the View and Edit menus, and extra toolbars.

For details about using the Graphics editor, see Help.

Importing and exporting graphic displays

Each graphic display's information is contained in a file called *Displayname*.gfx.

The Graphics Import Export Wizard in FactoryTalk View Studio allows you to export this information to an XML file, or to import a graphic display XML file.

You can export the display information, import the graphic display XML file to another FactoryTalk View application, and then modify it to suit your requirements. Or, you can modify the file before importing it.

You can use the Graphics Import Export Wizard to import graphic display information that has been created using an external programming tool or editor, or you can import a FactoryTalk View XML file.

For more information about importing and exporting graphic display files, see Appendix H.

Tools and tips for working in the Graphics editor

This section describes features of the Graphics editor that help you create your displays. It describes how to:

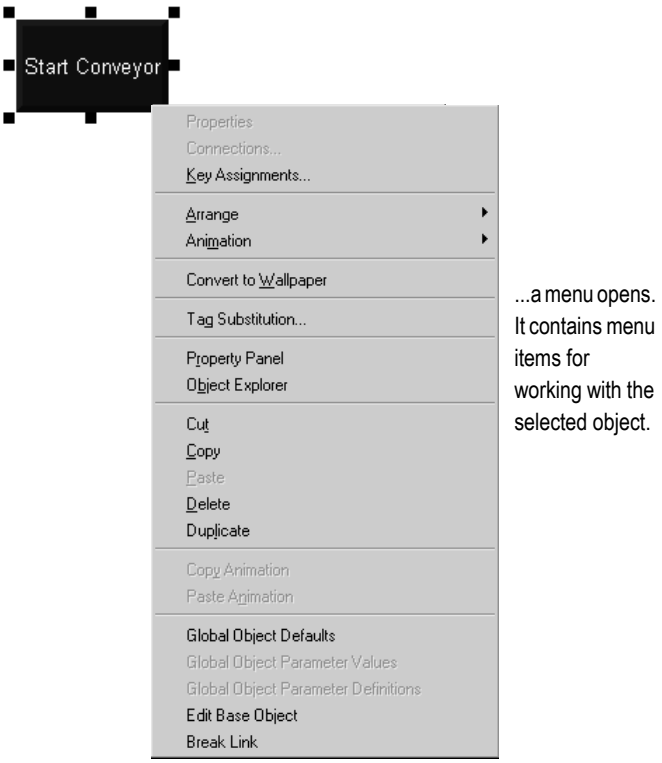
- use context menus and toolbars to perform actions quickly.
- view displays in grayscale to emulate the appearance of a PanelView™ Plus terminal.
- set up a grid that you can use to position and size objects precisely.
- zoom in when you need to look at details closely.
- correct mistakes.
- test your displays as you work.

Using context menus

No matter where you are in the Graphics editor, you can open a menu by clicking the right mouse button. This is often quicker than moving the mouse up to the menus at the top of the screen.

The items on the menu depend on the cursor's location. For example, when you right-click an object, the menu contains the most common actions you can perform on that object.

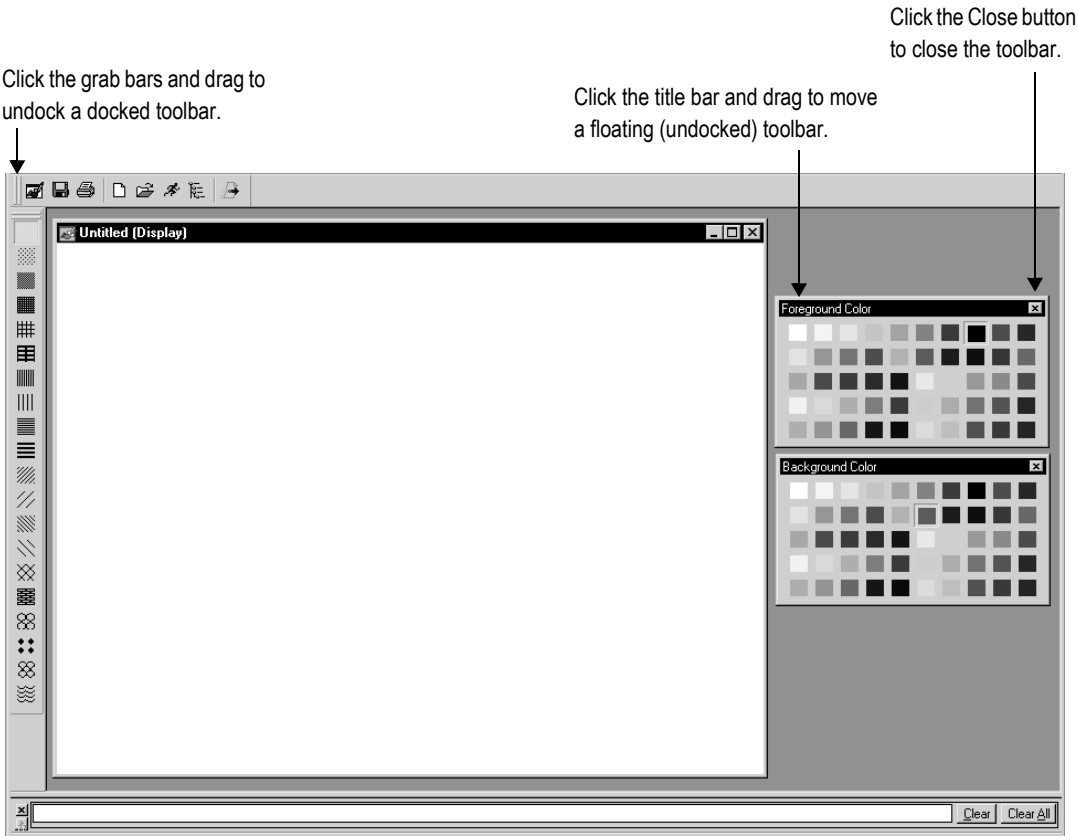
When you right-click an object...



...a menu opens. It contains menu items for working with the selected object.

Using the toolbars

The toolbars provide another convenient way to perform an action quickly. You can customize your workspace by dragging the toolbars to any location on the screen. You can also dock them to the inside edges of the FactoryTalk View Studio workspace.


Click the Close button to close the toolbar.
Click the grab bars and drag to undock a docked toolbar.
Click the title bar and drag to move a floating (undocked) toolbar.
Untitled (Display)
Foreground Color
Background Color
Clear
Clear All

To display a toolbar

- On the View menu, select Toolbars, and then click the toolbar to display.

The menu displays a check mark beside the toolbars that are already open.

To undock a toolbar

- Click the double “grab bars” at the left or top of the toolbar, and then drag. Press the Ctrl key to prevent accidental redocking.

To move an undocked toolbar

- Click the toolbar's title bar, and then drag. Press the Ctrl key to prevent accidental redocking.

To dock a toolbar

- Click the toolbar's title bar, and then drag to any edge of the workspace.

To close a toolbar

- On the View menu, select Toolbars, and then click the name of the toolbar to close, or click the toolbar's Close button.

Showing displays in grayscale

You can set displays to appear in grayscale, especially for developing applications that will run on the PanelView Plus grayscale terminals. When Show Displays in Grayscale is checked (on the View menu), all open displays will change from full color to grayscale. When Show Displays in Grayscale is cleared, all open displays will appear in color.

Show Displays in Grayscale does not work in Test Application mode.

Third party ActiveX® objects will not appear in grayscale if Show Displays in Grayscale is checked.

Using the grid

To size and position objects precisely, use the grid. You can change the grid settings at any time during the drawing process.

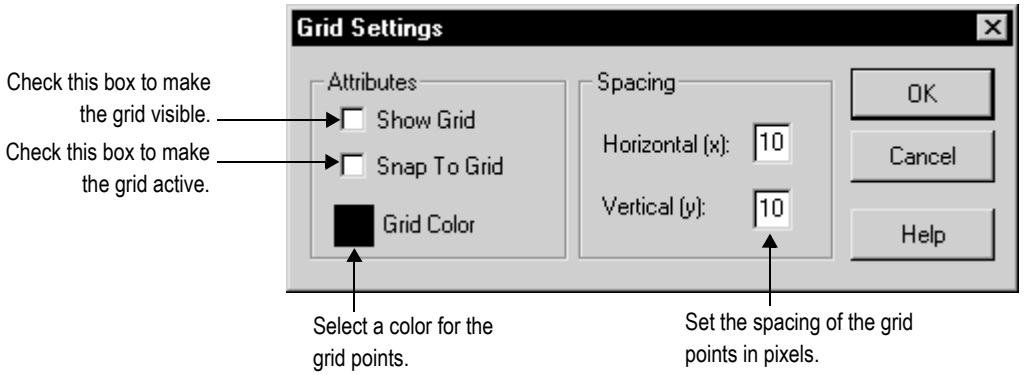
The grid can be active or passive. When the grid is active, all the objects you draw or position are pulled to the closest grid point. This makes it easy to align and size objects. When the grid is passive, it is visible but does not affect the position of your objects.

Make the grid passive to position an element between the grid lines. Make the grid active, and the next object you draw or place is automatically aligned with the grid. Making the grid active does not affect the placement of existing objects.

The grid is visible during application development only. It is not visible at run time.

To set up the grid

1. On the View menu, click Grid Settings, or right-click an empty area of the display and then click Grid Settings.



2. Specify the color and spacing of the grid points.
3. To turn on the grid, click Show Grid.

   When the Grid Settings dialog box is not open you can turn the grid on by clicking Show Grid on the View menu.
4. To make the grid active, click Snap To Grid.

   When the Grid Settings dialog box is not open you can make the grid active by clicking Snap On on the View menu.
5. Click OK.

To make the grid passive

- In the Grid Settings dialog box, clear the Snap To Grid check box, or on the View menu click Snap On to toggle the option off.

  There is no check mark beside the menu item when it is turned off.

To turn off the grid

- In the Grid Setting dialog box, clear the Show Grid check box, or on the View menu, click Show Grid to toggle the option off.

Zooming in and out

To magnify or reduce your view of a graphic display, use Zoom In and Zoom Out. Zoom In magnifies objects; Zoom Out reduces magnification.

Zoom In tool

To zoom in on objects

1. Select the objects you want to zoom in on.
2. On the View menu, click Zoom In, or click the Zoom In tool.

Zoom Out tool

To zoom out

- On the View menu, click Zoom Out, or click the Zoom Out tool.

Correcting mistakes

If you change your mind about something you did, you can undo the action. If you change your mind again, you can redo the action.

You can undo and redo all the operations you performed since you last saved the display, one operation at a time.

The operations you perform between opening and closing a dialog box are treated as a single operation. Operations you perform in the Property Panel are treated as separate operations.

Undo tool

To undo an operation

- On the Edit menu, click Undo, or click the Undo tool.

To redo an operation

- On the Edit menu, click Redo, or click the Redo tool.

Redo tool

Testing your displays as you work

To test the objects in your displays as you work, use the Test Display tool to switch to test mode. When you are finished testing, switch back to edit mode to continue editing.

Test mode is not the same as running the display. It does not change the appearance or position of the display as set up in the Display Settings dialog box. Alarm and information messages are not displayed, although if communications are set up, tag values are read and written. Display navigation, data logging, parameters, and macros do not work in this mode. If you want to test these features, test the application as described on page 14-2.

If you set up local messages and graphic objects to use multiple languages, the messages and objects are displayed in the current application language during test mode.

Using the Diagnostics List when in test mode

The Diagnostics List shows messages about system activities when you test your graphic displays. You can specify the types of messages to display in the Diagnostics List, move the list, resize it, and clear the messages in it.

For information about using the Diagnostics List, see page 2-5. For information about specifying the types of messages to show in the Diagnostics List, see page 10-5.

Test Display tool

To use test mode

- On the View menu, click Test Display, or click the Test Display tool.

Edit Display tool

To return to edit mode

- On the View menu, click Edit Display, or click the Edit Display tool.

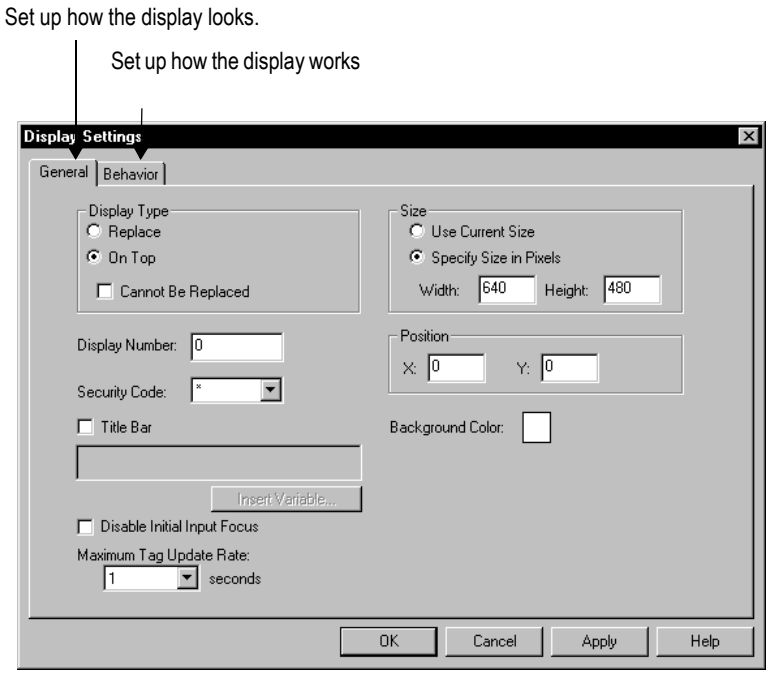
Setting up graphic displays

To set up a graphic display, specify its type, background color, and run-time behavior in the Display Settings dialog box. You can specify and edit the display settings at any time while you work on your display.

Specifying display settings

To specify display settings

- On the Edit menu, click Display Settings, or right-click an empty area of the display and then click Display Settings.



For details about the options in the Display Settings dialog box, see Help.

About display types

Replace displays

Replace is the default display type. Replace displays are full-sized displays. They use the project window size specified in the Project Settings editor.

For more information about the project window size, see page 4-11.

At run time, you can have only one Replace display open at a time. When the operator opens a Replace display, this is what happens:

- The Replace display that was open closes.
- On Top displays that do not use the Cannot Be Replaced option are closed.
- The new Replace display opens.
- On Top displays that use the Cannot Be Replaced option remain open, on top of the new Replace display.

If the operator attempts to open a Replace display that is already open (for example, using a goto display button to which the same display is assigned), the display does not close and FactoryTalk View sends an error message to FactoryTalk® Diagnostics.

On Top displays

Use the On Top option to create "pop-up" displays that open on top of the current Replace display. Usually, On Top displays are smaller than Replace displays, so the operator doesn't lose track of display navigation.

You can open multiple On Top displays. If more than one On Top display is open, the display that has focus, or had the most recent focus, appears on top.

When an On Top display closes, the display that had the most recent focus appears on top.

Use the Cannot Be Replaced option if you want the On Top display to remain open when a new Replace display is opened.

On Top displays do not have a Close button in the title bar. Be sure to create a close button graphic object in On Top displays so the operator can close them.

The operator cannot move an On Top display by dragging its title bar. The run-time position of the display is fixed (according to the position settings defined for the display).

You can specify unique titles for On Top displays. You can use embedded variables in the title, and the title text can switch languages at run time.

Resizing displays

The project window size is used for all Replace displays. If you change the project window size after you have designed any graphic displays, you have the option of scaling graphic displays.

If you choose to scale graphic displays, all Replace and On Top displays are resized and the objects in them are scaled to fit the new size. You can also specify whether to scale the font size and border size of the graphic objects, and the size of graphic images in the Images folder.

If you choose not to scale displays when you change the project window size, Replace displays are resized, but any objects in the displays remain the same size and in the same position as before. On Top displays are not resized.

For information about specifying the project window size, see page 4-11.

Changing the display area while working

You can change the display area of a display while you're working on it by dragging the border of the display area. For example, you might want to make the display area smaller so you can see parts of two displays in order to drag and drop objects between them.

Changing the display area in this manner does not change the display size for Replace displays. For On Top displays that are sized with the "Use Current Size" option, dragging the border does resize the display.

Another way to arrange multiple displays while working on them is to use the options on the Windows menu. For example, Tile Horizontal arranges all the open displays with as much of the top part of each display showing as possible.

Creating a background for your display

You can create a background for your graphic display by converting graphic objects to wallpaper. When objects are converted to wallpaper, they are locked into position and become an unchanging background for the other objects in the display.

Converting objects that do not need to be animated or updated with tag values can significantly improve the run-time performance of a graphic display.

Objects that have been converted to wallpaper cannot be selected or edited until you unlock the wallpaper. Also, animations attached to the wallpaper objects are not in effect. However, animations are restored when you unlock the wallpaper.

Similarly, any tags or expressions assigned to an object become inactive when the object is converted to wallpaper. Connections are restored if you unlock the wallpaper.

To manage a number of objects easily, group the objects, and then convert the group to wallpaper.

To convert objects to wallpaper

1. Select the objects to convert.

   For information about selecting objects, see page 20-23.

2. On the Edit menu, select Wallpaper, and then click Convert to Wallpaper.

   For a single object, you can right-click it and then click Convert to Wallpaper.

To unlock the wallpaper

- On the Edit menu, select Wallpaper, and then click Unlock All Wallpaper.

  All objects in the graphic display are converted back to their original state.

Using graphic libraries

There are two graphic libraries that are available, Symbol Factory and Graphics Library

FactoryTalk View Studio Graphics Library comes with a set of libraries, contained in the Libraries folder. As with a public library, the graphics libraries can provide you with source materials and reference information.

Each graphic library consists of a graphic display, with the file extension .gfx. The library displays contain graphic objects that you might find useful in your own application. Many of the objects are preconfigured with animation. For example, see the Conveyor parts library.

You can:

- look at the objects and displays to get ideas for your own application.
- drag and drop (or copy and paste) objects from the libraries into your own displays.

  For information about copying objects from a library into your graphic display, see page 20-40.

- use the objects as they are or change them to suit your needs.
- create your own libraries of objects.
- create libraries of displays that are translated into multiple languages.
- use libraries as displays in your application.

Working with Symbol Factory

Symbol Factory

The Symbol Factory is a library of over 5,000 graphics for industrial automation, including pumps, pipes, valves, tanks, mixers, motors, ducts, electrical symbols, flow meters, material handling, sensors, PLCs, transmitters, and ISA symbols.

To open Symbol Factory:

Symbol Factory opens into a new window when launched, there are four ways to open Symbol Factory:

- From the **Explorer**, click on the Symbol Factory Object.
- When the **Objects menu** is available, click on the Symbol Factory drop down menu item.
- When the **Objects toolbar** is available, click on the Symbol Factory icon.
- Clicking the **Launch Symbol Factory** button in the Image Browser.

To select a graphic:

1. Browse the Categories frame, clicking on a category to see the symbols in the right frame.
2. Click on the graphic to select it for the Graphic Display.

If the graphic is to be used in this original state, it can be dragged and dropped into the Graphic Display.

*When View Studio is unlicensed and in Grace Period mode, the Symbol Factory library will be in demo mode and restricted in the number and type of graphics available for use. Only a licensed View Studio can enable a fully licensed Symbol Factory library.*FactoryTalk ViewStudio

Manipulating the graphic:

With the graphic selected, it can be modified using Symbol Factory

1. Select Options on the menu.
2. Select Symbol Options from the drop down menu.
3. The Symbol Options dialog allows the graphic to be modified in several ways. The orientation can be changed, it can be rotated, the fill color can be changed and applied to the graphic in different modes.
4. The Preview frame will show the changes made to the graphic.
5. When finished modifying, the graphic can be dragged and dropped from the Preview frame to the Graphic Display, or copied and pasted into the Graphic Display.

Symbol Factory has it's own Help file which explains operations within Symbol Factory and it's functions.

For more information, click Help in the Symbol Factory

To open a graphic library

1. In the Explorer window, open the Graphics folder, and then open the Libraries folder.
2. Double-click the library name, or right-click it and then click Open.

Creating graphic libraries

You can create a graphic library in the Libraries folder, or create a graphic display in the Displays folder and then add the display to the Libraries folder.

To create a graphic library

1. In the Graphics folder, right-click Libraries and then click New.
2. Create the objects you want to put in the library.

   For information about creating graphic objects, see Chapter 20.

Save tool

3. On the File menu click Save, or click the Save tool.
4. In the Component name box, type a name for the library, and then click OK.

   The library is added to the list in the Libraries folder.

You can also create a graphic display and then use Add Component Into Application to add the display to the Libraries folder.

To add a graphic display to the library

1. Create the graphic display.
2. In the Explorer window, in the Graphics folder, right-click the Libraries icon.
3. Click Add Component Into Application.
4. In the dialog box, navigate to the Gfx folder, and then click the .gfx file for the display to use.

   The Gfx folder is located in:

   \Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME\HMI projects*Application Name* (Windows® XP or Windows Server 2003 R2)

   or

   \Users\Public\Public Documents\RSView Enterprise\ME\HMI projects*Application Name* (Windows Vista,Windows 7 Professional or Windows Server 2008)

   where *Application Name* is the name of your application.
5. Click Open. The display is copied into the Libraries folder.

Using libraries as displays in your application

The graphic libraries are available on the development computer, but do not appear at run time. To use a library as a graphic display at run time, you must add the library into your application's folder of graphic displays.

If the library doesn't contain strings for languages supported by the current application, the undefined strings are displayed with question marks (?).

To use a library as a display in your application

1. In the Explorer window, in the Graphics folder, right-click the Displays icon.
2. Click Add Component Into Application.
3. In the dialog box, navigate to the Libraries folder, and then click the .gfx file for the library to use.

   The Libraries folder is located in:

   \Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME (Windows XP or Windows Server 2003 R2)

   or

   \Users\Public\Public Documents\RSView Enterprise\ME (Windows Vista,Windows 7 Professional or Windows Server 2008)
4. Click Open. The library is copied into the Displays folder.

Using libraries to store displays with multiple languages

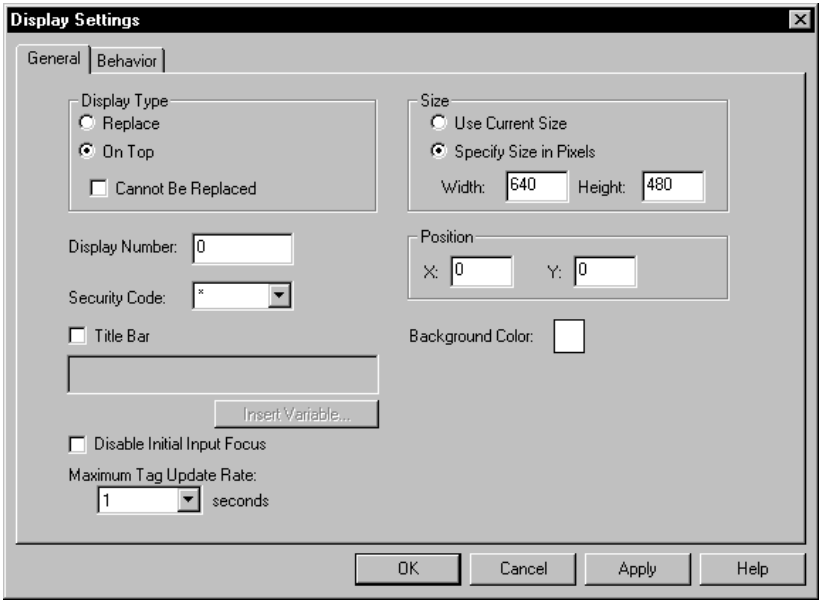
The maximum number of languages an application can use is 40 during development, and 20 at run time. Since the libraries are stored outside of the HMI project folder and are available to all applications, they do not have this limit. However, since they are not stored in the HMI project folder, you cannot export the strings in library displays for translation. Instead, export a graphic display for translation, import the translated strings, then add the display into the library.

When you use a library display in your application, make sure you add to your application the languages that you plan to use from the library.

To save a library display with multiple languages

1. Create a graphic display.
2. Export the text for your application, which will include the text used in the graphic display.
3. Translate the text strings into each desired language, saving the file with a new name for each language.
4. Import the files for all the new languages.
5. Add the graphic display to the Libraries folder.

   The library is created with the option Support Multiple Languages selected (in the Display Settings dialog box).



For detailed information about importing and exporting to use multiple languages, see Chapter 12.

To save a library display with more than 40 languages

1. Create a display in one application, with up to 40 languages, and add it to the library, as described in the previous section.
2. Add the display into a new application, with up to 40 different languages in the new application.
3. Export the text for your application, which will include the text used in the graphic display.
4. Translate the text strings into each desired language, saving the file with a new name for each language.
5. Import the files for the new languages.
6. Add the graphic display (with the same name as the display in step 1) to the Libraries folder.

   The new languages are added to the library. Make sure the display contains the same objects as the original display. Otherwise the new display will overwrite the previous display, and all the original language strings will be undefined.

What is displayed

When you open a library that supports multiple languages, the strings are displayed using the current application language, if available. If the library does not contain the current language, the strings are displayed as single question marks. Similarly, if the library contains the language but not all the strings are defined for the language, undefined strings are displayed as single question marks.

For more information about using multiple languages with graphic libraries, see Chapter 12.

Location of library components

The Libraries folder is located in:

\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME (Windows XP or Windows Server 2003 R2)

or

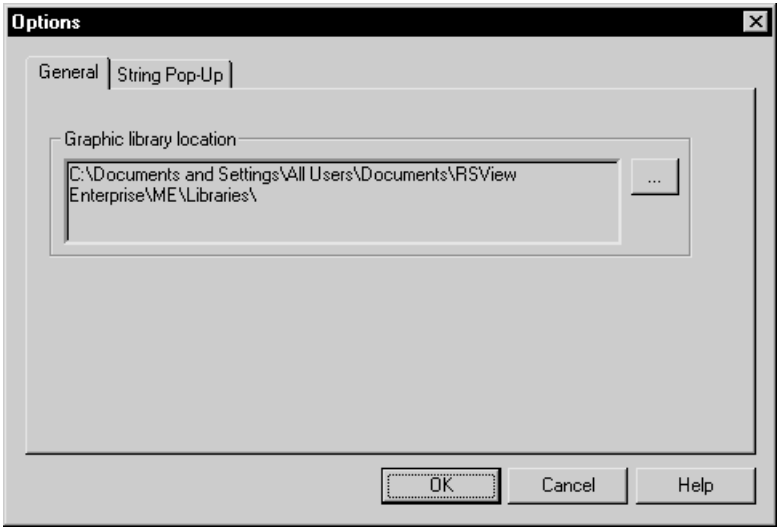
\Users\Public\Public Documents\RSView Enterprise\ME (Windows Vista,Windows 7 Professional or Windows Server 2008)

If desired, you can specify a different directory in which to store library components. If you specify a different directory, FactoryTalk View saves graphic libraries that you add or create in the new directory. Similarly, when you open a library component FactoryTalk View looks for the component in the specified directory.

If you specify a different directory but want to use the libraries that come with FactoryTalk View, use My Computer or Windows Explorer to copy the library component files into the directory you've specified, or else change the path back to the default path when you want to open a FactoryTalk View library component.

To specify a new path for graphic libraries

- On the Tools menu, click Options.



For details about using the Options dialog box, see Help.

Importing images into your application

You can use these types of external graphic files in your graphic displays:

- .bmp—bitmap images
- .jpg—JPEG images
- .dxf—AutoCAD® files
- .wmf—Windows metafiles

You import and place .dxf and .wmf files in your displays in one step. Once imported, they are converted to drawing objects. For more information about using these types of files in your displays, see page 20-21.

Bitmap images that come with FactoryTalk View Studio

FactoryTalk View Studio comes with sets of bitmaps that are useful for illustrating graphic objects and displays:

- arrows
- DIN symbols
- ISA symbols
- keyboard button symbols such as Enter and Page Up
- parts such as buttons, conveyors, pipes, tanks, and valves

The symbols and most of the arrows are monochrome (that is, use only two colors, one for the line and one for the fill).

You can set up the line and fill colors for the monochrome images that you use for your objects.

For color images, including JPEG images, you can specify whether to use a transparent or solid background fill. If you select the transparent background fill style, the black portions of the image become transparent.

For detailed information about setting up objects, see Help.

Location of bitmap files

The bitmap files that come with FactoryTalk View Studio are stored in this directory:

\Documents and Settings\All Users\Shared Documents\RSView Enterprise\Images (Windows XP or Windows Server 2003 R2)

or

\Users\Public\Public Documents\RSView Enterprise\Images (Windows Vista,Windows 7 Professional or Windows Server 2008)

The images are in folders called Arrows, DIN, ISA, ListKey, and Parts.

Importing bitmap and JPEG images

To use bitmap and JPEG images, you can:

- import the images first, and then place them in your displays as needed. This method is useful for images that you use to illustrate your displays.

  For information about placing images in your display once you've imported them, see page 20-14.

- use the Image Browser to import images as needed while setting up your graphic objects. This method is useful for images that you use as labels on your graphic objects.

  For information about using the Image Browser, see page 19-23.

- copy and paste images from the graphic libraries.

  For information about copying and pasting objects, see page 20-40.

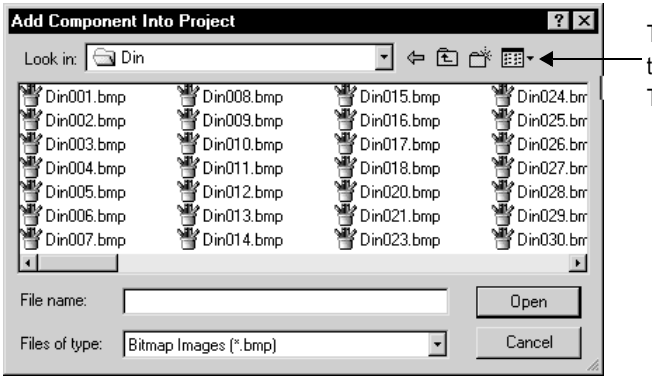
- copy and paste images from one application to another.

  For information about opening two applications at once, see page 4-9.

If you will be using images that have more than 256 colors, before importing the images set up your video adapter to display more than 256 colors. This will ensure that the colors of imported images appear the same as in the original. For more tips about using images, see page 19-25.

To import bitmap and JPEG images

1. In the Graphics folder, right-click Images and then click Add Component Into Application.



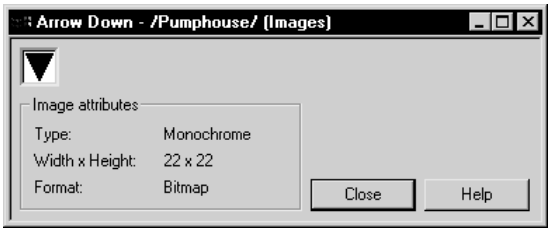
2. In the Files of type box, select the type of image to add.
3. Navigate to the directory where the .bmp or .jpg file is stored, and then click the file name.

   Shift-click or Ctrl-click to select additional files.

4. Click Open to add the selected files to the list in the Images folder.

To view an image that you've already imported

- In the Images folder, double-click the image name, or right-click it and then click Open.



Using the Image Browser to import images

Use the Image Browser to import images as needed while you set up graphic objects.

In the Image Browser you can:

- import images into the application.
- select the image to use on a graphic object.
- delete images from the application.

To open the Image Browser, use one of these methods

Browse button

- In an object's Properties dialog box, click the Browse button next to the Image box.

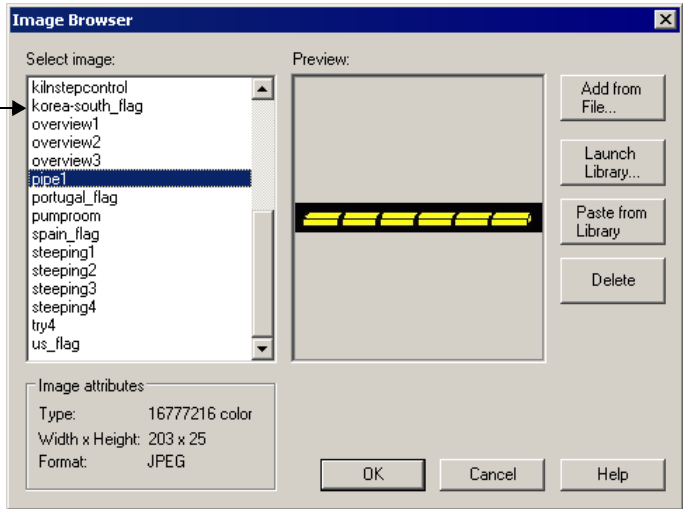
  Depending on the type of object, the Image box could be located on the General tab, Label tab, or States tab.

  For information about opening the Properties dialog box, see page 20-28.

- With one or more objects selected, in the Property Panel click the Image property, and then click the Browse button.

  For information about opening the Property Panel, see page 20-29.

Click an image to select it.



For details about using the Image Browser to import, select, and delete images, see Help.

You can also remove an image by clicking it in the Images folder and then right-clicking Remove or Delete. For more information, see page 18-4.

Using Symbol Factory

Symbol Factory is a third-party graphics library that provides a large number of quality graphic elements.

Import Symbol Factory objects directly into image container

1. From the Image Browser window, click the Launch Library… button. This will open a Symbol Factory window.
2. Browse through the Categories and locate the graphic to be used. Select the graphic so it is highlighted. Click the Copy button in Symbol Factory. Symbol Factory will be minimized to the system tray.
3. From the Image Browser, click on the Paste from Library button.
4. A dialog box will open and ask for a unique image name. Type the new name over the default text SFBitmap1.
5. Click the OK Button in Image name dialog. The dialog box will close returning you to the Image Browser. The new image will be displayed and the new image name shown in the image browser explorer.

6. Click the OK button in the Image Browser for the graphic to be placed in the current workspace.

Note that any Symbol Factory object, including Bitmap, DIB and metafile can be pasted into Image Browser where it will be stored as a bitmap.

Import Symbol Factory objects directly into display

1. Launch Symbol Factory either by using the Menu bar (Objects > Symbol Factory) or from the Objects toolbar ( ).
2. Browse through the Categories and locate the graphic to be used. Select the graphic so it is highlighted. To place the object into the display you could:

- Click the Copy button in Symbol Factory. Symbol Factory will be minimized to the system tray, then from the Menu bar click on Edit and paste.

or

- Click the object and hold down the mouse button while dragging the object to where you want it placed on the disply. Releasing the mouse drops the object onto the display.

Tips for using images

Using bitmaps versus JPEG images

When deciding whether to use a bitmap image or a JPEG image, consider these points:

- FactoryTalk View supports 256 color (grayscale) and 16 million color JPEG images only. For all other color types, use bitmaps.
- For large color images (16 million color, 320 x 240 pixels or larger), JPEG images load faster than bitmaps. In all other cases, bitmaps load faster than JPEGs.
- Color JPEG images have a much smaller file size than the equivalent bitmap image, and therefore require less disk space at run time.

Guidelines for using images

Images consume Windows resources, so when using graphic images use the lowest color depth possible.

The more colors you use, the more memory is consumed, and the longer the image takes to load and display.

This bitmap type	Consumes this many bits per pixel
Monochrome	1
16 color	4
256 color	8 (1 byte)
64 K color	16 (2 bytes)
16 million color	24 (3 bytes)

For example, a 24-bit bitmap image that measures 800x600 pixels consumes 1440 KB of memory. If the bitmap color depth is decreased to 256 colors, the image might have minor color loss, but the new image uses only 480 KB of memory.

Use images with a similar pixel size to the size of the FactoryTalk View object on which the image will be placed. FactoryTalk View resizes the image to fit the object, but if you use an image that is much larger than the object, the display will be slow to open at run time, due to the time required to resize the image.

Using local messages

Use local messages to give the operator ongoing information about the status of devices and processes. For example, you might use local messages to describe the status of a device whose condition cannot be shown graphically with complete accuracy.

The messages you create in the Local Messages editor are displayed in local message display objects in graphic displays. You can use multiple local message display objects in your application, and link each object to a different file of messages. Or, you can use the same file of messages for multiple local message display objects.

Local messages versus information messages

Use local messages to give the operator information in a specific graphic display while the display is open. To give the operator information no matter which display is open, use information messages.

For details about information messages, see Chapter 27.

Summary of steps

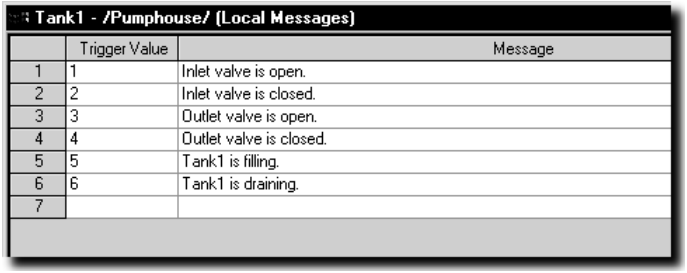
Follow these steps to set up local messages:

1. In the Local Messages editor, set up the messages and their trigger values.
2. In the Graphics editor, create local message display objects in the graphic displays in which you want the messages to appear at run time. For each local message display, assign a tag or expression to the Value connection and specify the file of messages to display.

   For information about creating graphic objects, see Chapter 20. For information about setting up local message display objects, see page 21-54.

Using the Local Messages editor

Use the Local Messages editor to create one or more files of local messages. Each file is stored in the editor's folder. You can open and work on multiple message files at the same time.


Tank1 - /Pumphouse/ (Local Messages)

	Trigger Value	Message
1	1	Inlet valve is open.
2	2	Inlet valve is closed.
3	3	Outlet valve is open.
4	4	Outlet valve is closed.
5	5	Tank1 is filling.
6	6	Tank1 is draining.
7		

You can define up to 10,000 messages in each message file.

For details about using the Local Messages editor, see Help.

Preparing to set up local messages

As your application is running, information is continually sent to the data source about the state of various processes. For example, your application might be monitoring whether a valve is open or closed, or the temperature in a boiler. Values representing the status of these processes are sent to the data source.

The data source

The FactoryTalk View documentation uses the term data source as a generic term that includes all possible sources of tag data, for both data server tags and HMI tags. The data source can be memory or a device such as a programmable controller or OPC server. FactoryTalk View writes values to and reads values from the data source.

The data source is set up to exchange information (in the form of numeric or string values) between FactoryTalk View and the machine that your application is controlling.

Identifying the tags and values to monitor

To set up local messages, determine which tags associated with machine processes to monitor, and identify the values for those tags that will trigger local messages.

For information about creating HMI tags, see Chapter 7.

How local messages work

These are the key parts of the local message system:

- Local message files—text files containing lists of messages, with a numeric trigger value for each message
- Local message display object—a graphic object that displays local messages when the Value connection assigned to the object matches a message's trigger value
- Value connection—a tag or expression. When the value of this connection matches a message's trigger value, the local message display object displays the associated message.

The local message display object always appears in the graphic display it's placed in, whether or not there is a message to display. However, the operator does not see the message unless the object is located in the display the operator is currently viewing.

The following example shows how the key parts of the local message system work together.

Example: Displaying local messages

This example shows how to notify the operator of the status of a hoist.

1. Create a tag called Hoist_Status. This tag points to an address in a programmable controller that is linked to sensors on the hoist. The tag has five possible values:

The tag has this value	When the hoist has this status
1	At bottom
2	Raising
3	Stopped between the top and bottom
4	Lowering
5	At top

2. In the Local Messages editor, create these messages with trigger values matching the values that will be sent to the Hoist_Status tag:

Trigger value	Message
1	The hoist is ready to rise
2	The hoist is raising the pallet.
3	The hoist has stopped.
4	The hoist is lowering the pallet.
5	The hoist is finished rising.

   Save the message file with the name “Hoist status.”

3. In the Graphics editor, create a local message display object. In the object’s Properties dialog box, assign the Hoist_Status tag to the Value connection, and select the Hoist status message file.

At run time, when the operator views the graphic display containing the local message display object, the status of the hoist is displayed.

Local messages and trigger values

Create messages associated with each tag value that you want to inform the operator about. Assign each message a trigger value, and set up the data source to send the trigger value to the Value connection. You can use both HMI and data server tags

The trigger value can be any non-zero integer value (positive or negative). Trigger values do not need to be contiguous, but they must be unique for each message. For example, you could use trigger values of 1, 2, and 3, or values of 10, 20, and 30.

If you use an analog tag or an expression, you can use any non-zero integer or floating point value to trigger an alarm. Floating point values are rounded to the nearest integer. For information about how values are rounded, see page 7-2.

Trigger values cannot be 0. Digital tags have two possible values, 0 and 1. Therefore, if you use a digital tag you can only use the value 1 to trigger a message. If you want to use a digital tag to trigger two different messages, create an expression that adds 1 to the digital tag’s value. That way, you can use the trigger values 1 and 2.

When the Value connection’s value is 0, the local message display object is cleared.

Creating local messages in multiple languages

FactoryTalk View 5.00 supports local messages in multiple languages. When you create local messages, they are in the current application language. You can export the local messages for translation and then import them back into the application. For details, see Chapter 12.

Language switching local messages in FactoryTalk View ME Station 4.00

For applications that will run in FactoryTalk View ME Station version 4.00, use the CurrentLanguage( ) expression function to specify message offsets in the local message file. In the file, divide your messages into sections for each language. For information about the CurrentLanguage( ) function, see page 23-14.

How the local message display graphic object works

When you open a graphic display at run time, FactoryTalk View reads the value of the Value connection and updates the local message display object based on the value.

What is displayed

- If the Value connection is unassigned, the display is filled with question marks (?).
- The Value connection is rounded to the nearest integer. If the value does not match any of the trigger values in the specified message file, the display is filled with question marks.

  For information about how values are rounded, see page 7-2.
- If the message is too long to fit in the object, the last displayed character is replaced with an asterisk (*).
- When the Value connection's value is 0, the display is cleared.
- If you set up local messages in multiple languages, messages are displayed in the current application language. When a language switch occurs, the message that was already in the local message display remains in the language that it originally appeared in. New messages are displayed in the new language.

Printing displays

You can print your graphic displays on the development computer. This might be useful if you want other people to review the displays before implementing the application, or if you want to keep a visual record of the displays.

You can also print graphic displays at run time, to provide a printed record of process values such as trend data.

For information about printing on the development computer, see page 2-13.

Printing displays at run time

When you print a display at run time, everything on the screen is printed, including the current display, pop-up windows, and any visible background applications.

For information about specifying which printer to use at run time for applications that will run on a personal computer, see page 15-10.

For information about specifying printer options for applications that will run on a PanelView™ Plus 6, PanelView Plus or PanelView Plus CE terminal, see the *PanelView Plus Terminals User Manual*.

To print graphic displays at run time, use one or both of these methods

- Create display print buttons in the graphic displays you want to print. At run time, the operator presses the buttons to print the displays.

  For information about creating graphic objects, see Chapter 20.

- Assign a tag or expression to the Remote Display Print connection (in the Global Connections editor). When the value of the tag or expression changes from 0 to a non-zero value, the current displays are automatically printed.

  Program the data source to trigger the change as often as you want the data printed.

  For more information about setting up remote display printing, see page 8-5.

20 Using graphic objects

This chapter describes the types of graphic objects and outlines how to:

- create graphic objects, including drawing and ActiveX® objects.
- select and deselect objects and use the Object Explorer.
- use the Properties dialog box and Property Panel to set up objects.
- color and name objects.
- test how objects look in different states.
- assign tags and expressions to objects.
- replace tags using tag substitution.
- use tag placeholders.
- move, copy, duplicate, resize, reshape, and delete objects.
- group and ungroup objects, and edit group objects.
- arrange objects and lock objects into position.

For information about setting up graphic objects once you've created them, see Chapter 21. For information about setting up global objects, see Chapter 25.

For examples of how to set up objects, see the sample applications that come with FactoryTalk® View Studio. The Help also provides examples of how to use objects.

Types of graphic objects

The elements that make up a graphic display are called graphic objects. Use objects to control your process, machines, and application.

FactoryTalk View comes with a complete range of configurable objects such as push buttons, list selectors, bar graphs, and trends. Some objects interact with the data source, allowing the operator to change or view tag values. For example, the operator can push a button to set a tag value to 1, causing a programmable controller to start a conveyor belt. Other objects are used to control your application. For example, there are button objects that you can use to change displays and scroll through lists.

FactoryTalk View also comes with drawing objects that you can use to illustrate your graphic displays. The drawing objects include text, bitmap images, and geometric and freehand shapes.

FactoryTalk View also supports the use of ActiveX objects—third-party software components that you can use to control processes and display information. The ActiveX objects available depend on which third-party applications are installed on your development computer. For example, products such as Microsoft® Visual Basic®, Rockwell Automation®, and Microsoft Office provide ActiveX objects that are configurable in FactoryTalk View Studio.

Using the tables

The tables beginning on the next page will help you choose which objects to use to control your application, machines, and process. The tables group the objects according to function, provide an overview of what each object does, and list cross-references to more detailed information about using the objects.

About connections

Many of the objects use connections to interact with the data source. A connection is the link between the object and the data source. Depending on an object's function, the object may have more than one connection. For example, a momentary push button has a Value connection and an Indicator connection. The Value connection is used to set a value at the data source, and the Indicator connection is used to display the data source value in your graphic display.

By assigning tags or expressions to an object's connections, you control the flow of data between the application and the data source, which in turn controls your process or machines. Assign tags or expressions to an object's connections in the Connections tab of the object's Properties dialog box (see page 20-26) or in the Connections tab of the Property Panel (see page 20-29).

Illustrating your displays

Use this graphic object	To do this
Text	Create text for labels or instructions in the display. See page 20-12.
Image	Place images in your display. For more information, see page 20-14.
Panel	Draw rectangles that have borders. See page 20-15.
Arc	Draw an arc (a segment of an ellipse or circle's perimeter). See page 20-16.
Ellipse	Draw ellipses and circles. See page 20-17.
Freehand	Draw freehand shapes as you would with a pen on paper. See page 20-17.
Line	Draw straight diagonal, horizontal, and vertical lines. See page 20-17.
Polygon	Draw a series of connected straight lines forming a closed shape. See page 20-18.
Polyline	Draw a series of connected straight lines. See page 20-18.
Rectangle	Draw rectangles and squares. See page 20-19.
Rounded rectangle	Draw rectangles and squares with rounded corners. See page 20-19.
Wedge	Draw a filled segment of an ellipse or circle. See page 20-16.
Symbol Factory	Select images to place in your display.

Controlling the application

Use this graphic object	To do this
Goto display button	Open a graphic display. For details, see page 13-4.
Return to display button	Close a display and return to the previous display. For details, see page 13-5.
Close display button	Close a display. Can also send a value to a tag. For details, see page 13-6.
Display list selector	Select a display to open from a list of displays. For details, see page 13-6.
Display print button	Print the current display. For details, see page 19-31.
Language switch button	Switch the application language. For details, see page 21-16.
Login button	Open the Login dialog box and then log in. For details, see page 11-12.
Logout button	Log out of the application. For details, see page 11-13.
Password button	Change the current user's password. For details, see page 17-4.

Use this graphic object	To do this
Shutdown button	Stop the application and shut down FactoryTalk View ME Station. For details, see page 13-7.
Goto configure mode button	Stop the application and open the FactoryTalk View ME Station dialog box. For details, see page 13-4.
Print alarm history button	Print a report of alarm messages in the alarm log file. You can print a report for all alarms, or for a specified alarm trigger. For details, see page 21-58.
Print alarm status button	Print a report of the status of alarms, including how many times each alarm was triggered and the time in alarm. You can print a report for all alarms, or for a specified alarm trigger. For details, see page 21-59.

Starting and controlling processes

Use this graphic object	To do this
Momentary push button	Start a process or action by sending one value to the tag when pressed, and another value when released. For details, see page 21-19.
Maintained push button	Toggle between two values by sending one value to the tag when pressed, and a second value the next time the button is pressed and released. This button is useful for changing a setting within a machine or process, but not for starting the machine or process. For details, see page 21-21.
Latched push button	Start a machine or process. The button remains set (latched) until the process is complete. For example, use this button to start a bag filling machine. When the process is complete (the bag is full), the button is reset (unlatched) by the Handshake connection. For details, see page 21-22.
Multistate push button	Cycle through a series of values. Each time the operator presses the button, the value for the next state is sent to the tag. When the button is in its last state, pressing it changes the button to its first state and writes out the first state value. This button is useful when you want the operator to see and select multiple options in sequence, using a single button. The button displays the current state of an operation by showing a different color, caption, or image to reflect the different states. For details, see page 21-24.
Interlocked push button	Use a group of buttons to send values to the same tag. When the operator presses one button in the group, the button's value is sent to the tag, and the button remains highlighted as long as the tag value is the same as the button's value. Pressing another button in the group releases the first button, and sends a new value to the tag. For details, see page 21-25. You can also use a single interlocked push button to send a value to a tag.

Use this graphic object	To do this
Ramp button	Increase or decrease the value of a tag by a specified integer or floating-point value. For example, use two ramp buttons together to create a raise/lower control. For details, see page 21-27.
Control list selector	Select from a list of states for a process or operation. The list is highlighted to show the current state, and the operator can scroll through the list to select a different state. The value assigned to the selected state is written to the tag. For details, see page 21-49.
Piloted control list selector	Select from a list of states for a process or operation. The list is highlighted to show the current state, and the operator or a remote device such as a programmable controller can scroll through the list to select a different state. For details, see page 21-51.
Drawing object with horizontal or vertical slider animation	Set the value of a tag by dragging the slider object. The pixel position of the slider is translated into a value that is written to the tag. If the value of the tag is changed at the data source, the position of the slider changes to reflect this. For information about animation, see Chapter 22.
ActiveX object	Change tag values using a third-party object connected to an analog, digital, or string tag, including both HMI and data server tags. When the object's property value changes, the new value is written to the associated tag. For details, see page 20-21.

Displaying processes and values graphically

Use this graphic object	To display this
Bar graph	Numeric values in bar graph format. The bar graph increases or decreases in size to show the changing value. For details, see page 21-46.
Gauge	Numeric values in dial format. The gauge's needle moves around the dial to show the changing value. For details, see page 21-47.
Scale	A static indication of the range of values for a bar graph. For details, see page 21-48.
Multistate indicator	The state of a process, on a panel that changes its color, image, or caption to indicate the current state. Each state is set up to correspond to a numeric tag value. For details, see page 21-39.
Symbol	The state of a process, using a monochrome image that changes color to indicate the current state. Each state corresponds to a numeric tag value. This object is useful for showing the state of a process or operation at a glance. For details, see page 21-41.

Use this graphic object	To display this
List indicator	The state of a process, using a list of possible states with the current state highlighted. Each state is represented by a caption in the list, and corresponds to a numeric tag value. This indicator is useful if you want to view the current state, but also want to see the other possible states. For sequential processes, the list can alert the operator about what happens next in the process. For details, see page 21-42.
Trend	Historical or current numeric tag values, plotted against time or displayed in an XY plot (where one or more tags' values are plotted against another tag's values to show the relationship between them). For details, see Chapter 28.
Time and date display	Display the current time and date. For details, see page 21-57.
ActiveX object	Data using a third-party object connected to an analog, digital, or string tag, including both HMI and data server tags. The format of the data displayed depends on the object. For details, see page 20-21.
Drawing object with rotation, width, height, fill, color, or horizontal or vertical position animation	The value of a tag using a pictorial representation of the current value in relation to a range of possible values. For example, use rotation animation to show the tag value as a needle's position on a dial. For color animation, assign different colors to represent different values. For information about animation, see Chapter 22.

Working with lists, trends, alarm banners, and numeric input objects

Use this button	With this graphic object	To do this
Pause button	Trend	Toggle a trend between pausing and automatic scrolling.
Next pen button	Trend	Change the vertical axis labels for a trend to the scale for the next pen.
Backspace button	Control list selector Piloted control list selector	Move the cursor back to the highlighted item in the list.
End button	Lists and trends	List—move to the bottom item in the list. Trend—resume trend scrolling and move to the current (latest) data in the trend.
Enter button	Lists Alarm list and alarm banner	Select the item the cursor is pointing to. Acknowledge the currently selected alarm.

Use this button	With this graphic object	To do this
Home button	Lists and trends	List—move to the top item in the list. Trend—pause the trend and move to the earliest data in the trend.
Move left / right buttons	Trend	Pause the trend and scroll to the left or right.
Move up / down buttons	Lists, trends, and numeric input objects	List—move up or down one item in the list. Trend—scroll up or down to display higher or lower values on the vertical scale. Numeric input cursor point and numeric input enable button—ramp the value up or down.
Page up / down buttons	Lists	Move up or down one page in the list.
Acknowledge alarm button	Alarm list Alarm banner	Acknowledge and silence the selected alarm.
Alarm status mode button	Alarm status list	Change the type of alarms displayed in the alarm status list, from all alarms to active alarms to past alarms.
Clear alarm banner button	Alarm banner	Clear the alarm in the alarm banner without removing the alarm from the alarm log file and alarm lists.
Diagnostics clear button	Diagnostics list	Remove the selected message from all diagnostics lists.
Information acknowledge button	Information message display	Acknowledge the current message in the display.

For more information about using the buttons with lists and trends, see the topics on these pages:

For information about	See
Linking a button to a specific list, alarm banner, or trend object	Page 9
Using buttons with alarm lists, alarm banners, and alarm status lists	Page 36
Using buttons with information message displays	Page 6
Using buttons with diagnostics lists	Page 13
Using buttons with trends	Page 11

Unlike the buttons in the previous table, the following buttons do not work with specific graphic objects. You can use them to work directly with alarms in the alarm history and with the application's diagnostics messages.

Use this button	To do this
Acknowledge all alarms button	Acknowledge and silence all currently unacknowledged alarms, or the alarms for a specific alarm trigger.
Clear alarm history button	Remove alarms from the alarm log file and all alarm lists. You can remove all alarms, or just the alarms for a specific alarm trigger. You can also reset the cleared alarms. This resets the number of times an alarm has been triggered to 0, and the accumulated time in alarm to 0.
Reset alarm status button	Reset the number of times an alarm has been triggered to 0, and the accumulated time in alarm to 0, for all alarms.
Silence alarms button	Silence the audio indicator for all current alarms (on personal computers only).
Sort alarms button	Toggle between sorting alarms in alarm lists and the alarm log file by time and by trigger value.
Diagnostics clear all button	Remove all diagnostics messages from all diagnostic lists.

Entering and displaying numeric and string values

Use this graphic object	To do this
Numeric input enable button	Enter a numeric value and then write the value to a tag or an expression, or ramp a value at the data source. For details, see page 17-6.
Numeric input cursor point	Enter a numeric value and then write the value to a tag or an expression, or ramp a value at the data source. For details, see page 17-6.
String input enable button	Enter a string value and then write the value to a tag. For details, see page 17-10.
Numeric display	Display numeric tag values. For example, display the current temperature of an oven. For details, see page 21-28.
String display	Display string tag values. For example, set up the data source to generate strings that report on the state of a process of operation, or that provide the operator with instructions about what to do next. For details, see page 21-33.

Use this graphic object	To do this
RecipePlus button	Display data set and tag values for ingredients in the RecipePlus table. Write tag values from the selected data set to the data source. Write tag values from the data source to the selected data set or to a new data set. Save data set values from the table to a recipe file. Rename or delete recipe units. For details, see page 29-3.
RecipePlus selector	Select the recipe unit to display, download from, write to, rename, or delete. For details, see page 29-2.
RecipePlus table	Display and compare recipe data set values and tag values. Edit data set values. For details, see page 29-2.
ActiveX object	Enter or display data using a third-party object connected to an analog, digital, or string tag, including both HMI and data server tags. The format of the data entered or displayed depends on the object. For details, see page 20-21.

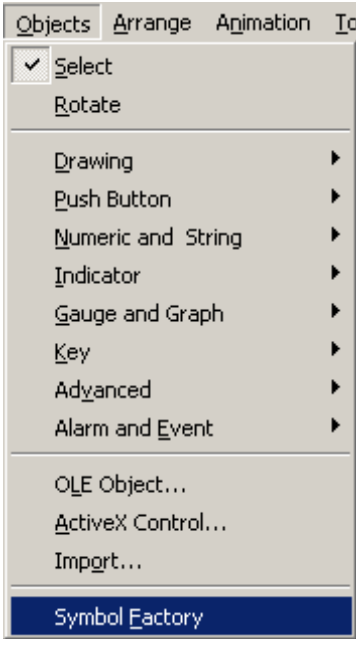
Displaying alarms and messages

Use this graphic object	To display this
Alarm list	Multiple alarm messages, including the time the alarms are triggered and acknowledged. For details, see page 9-32.
Alarm banner	A single unacknowledged alarm message. For details, see page 9-33.
Alarm status list	The status of alarms, including how many times an alarm has been triggered and how long it has been active. For details, see page 9-34.
Diagnostics list	Messages about system activity such as tag reads, tag writes, and communications errors. For details, see page 10-12.
Information message display	Messages about the process, prompts or instructions, and information about current states. For details, see page 27-6.
Local message display	Ongoing information about the status of devices or processes. For details, see page 19-30.

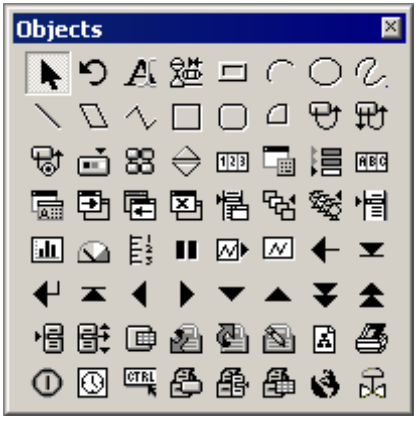
Selecting tools for creating graphic objects

The Objects menu in the Graphics editor contains items for creating objects, as well as items for selecting and rotating objects. You can also create most objects using the tools on the Objects toolbar.

Objects menu



Objects toolbar



Before you can create an object, you must select the object's tool, either by clicking a menu item or by clicking the tool on the toolbar. When you position a cursor over a tool on the toolbar, the name of the tool is displayed in a tooltip and in the status bar.

To select a tool

- Click the tool on the toolbar or on the Objects menu. When you click a tool, the pointer changes to show which tool is active.

Freehand tool

Text tool

To deselect a tool, do one of the following

- Double-click an empty area in the display.
- Click the Select tool.
- Click another tool.

Select tool

For some drawing objects, double-clicking an empty area of the display creates another instance of the object. For these objects, to finish drawing, click the Select tool. For more information, see the instructions for creating drawing objects, beginning on page 20-12.

Before you begin creating objects

To size and position objects precisely as you create them, use the grid.

To use the grid

- On the View menu, click Show Grid, and then click Snap On.

  For information about setting up the grid, see page 19-8.

The next sections describe how to create graphic objects. For information about setting up graphic objects once you've created them, see Chapter 21. For information about attaching animation to the objects you create, see Chapter 22.

Creating graphic objects

This section applies to graphic objects in general.

ActiveX objects and some drawing objects require extra steps to create them. For details about creating drawing objects, see the next section. For information about ActiveX objects, see page 20-21.

To create a graphic object

1. Select the tool for the object to create.
2. Click the mouse where you want to position the object, and then drag to draw a rectangle the general size you want the object to be.
3. Double-click the object to open its Properties dialog box.
4. In the dialog box, specify how the object looks, its behavior, and connections. For more information about the Properties dialog box, see page 20-26.

   You can also use the Property Panel to set up objects. For information about using the Property Panel, see page 20-29.

Creating drawing objects

The following instructions for creating drawing objects describe how to create the objects and then open the objects' Properties dialog boxes to set up how the objects look. For information about using the Properties dialog box, see page 20-26.

You can also use the Property Panel to set up objects. For information about using the Property Panel, see page 20-29.

Creating text

Choosing fonts

You can select any font you have installed, but TrueType™ and OpenType® fonts are recommended. These fonts can be resized easily, without losing text quality.

For PanelView™ Plus and PanelView™ Plus CE terminals, you must use TrueType fonts.

If you run an application on a computer that does not have the fonts you used when setting up the application, Windows® substitutes with the fonts that most closely match the fonts you specified.

Choosing fonts for language switching

If you are going to use the application with multiple languages, we recommend using Microsoft Sans Serif or Tahoma. These fonts allow for font linking to support the character sets of other languages. PanelView Plus 6, PanelView Plus and PanelView Plus CE terminals are shipped with font linking turned on.

For more information about font linking, see Help. For more information about setting up languages for your application, see Chapter 12.

Using the Size to fit option

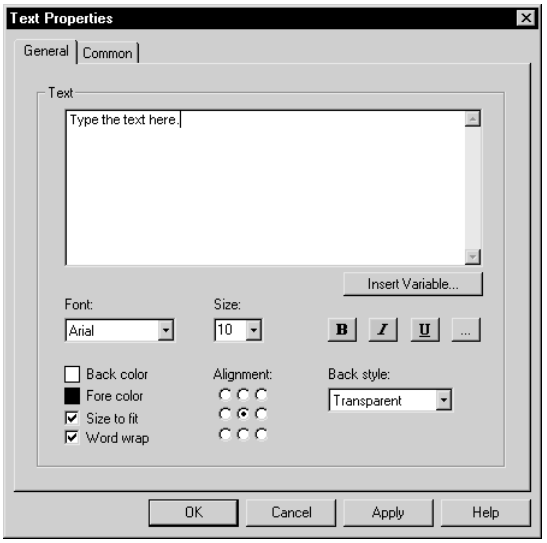
If you use the Size to fit option, the size of the text object will likely change for different languages. Make sure you check all displays containing translated language strings.

To create a text object

Text tool

1. Select the Text tool.
2. Click the mouse where you want to position the text, and then drag to draw a rectangle.

The Text Properties dialog box opens.



3. Select text options.

   For information about the options in the dialog box, see Help.

4. To close the dialog box, click OK.

   The text is positioned where you drew the rectangle.

5. To create another text object, move to a new area in the display, and then repeat steps 2 through 4.

After you've set up one text object to look the way you want, copy and paste it to create additional text objects with the same formatting. Then edit the text of the new objects.

To edit a text object

1. Double-click the text.

   The Text Properties dialog box opens.

2. In the Text box, click where you want to make the change. To delete text characters, use the Backspace and Delete keys.

Creating images

Use the image graphic object to place images in your graphic displays. Images support visibility animation only. You can use images already contained in the Images folder or use Symbol Factory to select and add a graphic to the display and the Images folder.

Using bitmaps and JPEG images

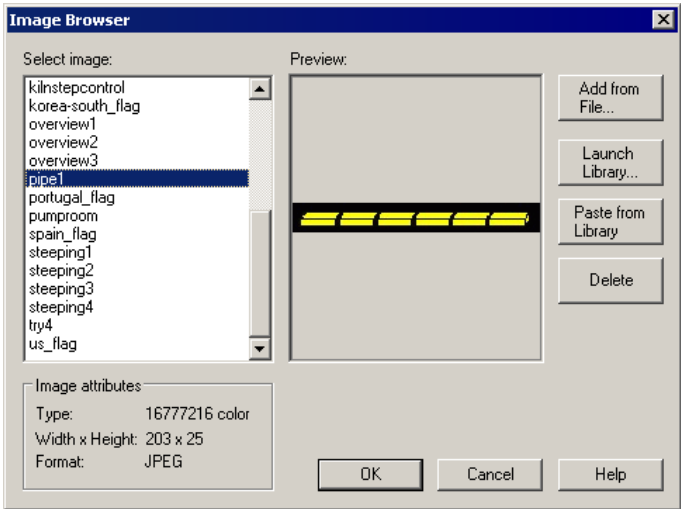
Before you can place a bitmap or JPEG image in a display, you must import the image into your application. For more information, see page 19-21.

To place a bitmap or JPEG image in a display

Image tool

1. Select the Image tool.
2. Click the mouse where you want to position the image, and then drag to draw a rectangle.

   The Image Browser opens.



3. In the Select image list, click the image to place, and then click OK.

   For more information about using the Image Browser, see page 19-23.

   The image is placed where you drew the rectangle, but the actual size of the image is used, rather than the size of the rectangle you drew.
4. To change the image's attributes, double-click the image to open the Image Properties dialog box.

5. Select image options.

   For information about the options in the dialog box, see Help.

6. Click OK to close the dialog box.

To add an image from Symbol Factory to a graphic object using the image browser:

1. In the graphic display, draw the graphic object you are going to import an image for. The Image Browser will open.
2. In the Image Browser, click Launch Library... Symbol Factory will open as a new window.
3. Browse the Categories frame, clicking on a category to see the symbols in the right frame.
4. Click on the graphic to select it for the Graphic Display.
5. Click Copy, the Symbol Factory minimizes, returning to the Image Browser.
6. Click the Paste from Library button. A dialog box Image Name Entry will open.
7. Type in an unique name for the image, then click the OK button.
8. The graphic will now be displayed in the Preview window. The graphic has been added to the list in the Image Browser. This also adds the image to the Images folder in the Explorer window.
9. Click OK to close the Image Browser. The image will be in the Graphic Display.

Symbol Factory objects imported by the Image Browser will by saved in the Images folder as a bitmap.

Creating panels

Panels support visibility animation only.

To create a panel

Panel tool

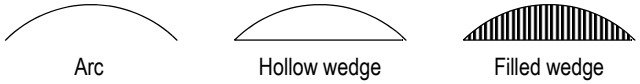
1. Select the Panel tool.
2. Click the mouse where you want to position the panel, and then drag to draw a rectangle the general size you want the panel to be.
3. To change how the panel looks, double-click the panel to open the Panel Properties dialog box.
4. Select panel options.

   For information about the options in the dialog box, see Help.

5. To close the dialog box, click OK.

Creating arcs and wedges

Arcs and wedges are drawn in two steps: first you create an ellipse or circle, and then you reshape it into the segment you want.



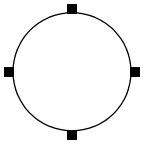
To create an arc or wedge

Arc tool

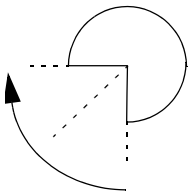
1. Select the Arc or Wedge tool.
2. Click the mouse where you want to position the object, and then drag to draw an ellipse or circle.

   To base the arc or wedge on a circle rather than an ellipse, hold down Ctrl while you drag.

   When you release the mouse button, a set of handles appears so you can decrease the angle of the wedge or arc from 360 degrees to the desired angle.



3. Click a handle, and drag the mouse to 'cut out' part of the circle.



4. To finish drawing, click the object.
5. To change how the object looks, click Properties on the context menu, or double-click the object to open its Properties dialog box.
6. Select arc or wedge options.

   For information about the options in the dialog box, see Help.

7. To close the dialog box, click OK.

You can also use the Arc and Wedge tools to reshape arcs and wedges. For more information, see page 20-43.

Creating ellipses and circles

Use the Ellipse tool to draw an ellipse or circle.

To create an ellipse or circle

Ellipse tool

1. Select the Ellipse tool.
2. Click the mouse where you want to position the object, and then drag to draw an ellipse or circle of the desired size.

   To draw a circle, hold down Ctrl while you drag.
3. To change how the object looks, double-click it to open the object's Properties dialog box.
4. Select circle or ellipse options.

   For information about the options in the dialog box, see Help.
5. To close the dialog box, click OK.

Creating freehand shapes

Using the Freehand tool is similar to drawing with a pen on paper.

To create a freehand shape

Freehand tool

1. Select the Freehand tool.
2. Click and drag to create the shape you want.
3. To change how the object looks, double-click it to open the Freehand Properties dialog box.
4. Select freehand options.

   For information about the options in the dialog box, see Help.
5. To close the dialog box, click OK.

Creating lines

To create a line

1. Select the Line tool.

Line tool

2. Click where you want the line to start, and then drag from the beginning point to the end point.

   To draw horizontal or vertical lines, hold down Ctrl while you drag the mouse.

3. To change how the line looks, right-click the line and then click Properties on the context menu. The Line Properties dialog box opens.

4. Select line options.

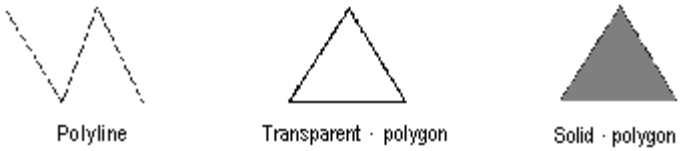
   For information about the options in the dialog box, see Help.

5. To close the dialog box, click OK.

You can use the Polyline tool to convert the line into a polyline. For more information, see page 20-43.

Creating polygons and polylines

A polyline is a series of connected line segments. A polygon is a multi-sided object (with three or more sides). For example, use the polygon shape if you want to create triangles.



To create a polygon or polyline

Polygon tool

Polyline tool

1. Select the Polygon or Polyline tool.

2. Click and drag to create the first segment of the object. Release the mouse button.

   To draw horizontal or vertical lines, hold down Ctrl while you drag.

3. Move the mouse to where you want the next segment to end, and then click.

   Repeat this step until you have completed the object.

4. To finish drawing, double-click an empty area of the display, or click the Select tool.
5. To change how the object looks, double-click it to open the object's Properties dialog box.
6. Select polygon or polyline options.

   For information about the options in the dialog box, see Help.
7. To close the dialog box, click OK.

You can use the Polygon tool to reshape lines, polygons, polylines, and rectangles. For more information, see page 20-43.

Creating rectangles and squares

To create a rectangle or square

Rectangle tool

1. Select the Rectangle tool.
2. Click the mouse where you want to position the object, and then drag until the rectangle or square is the size you want.

   To draw a square, hold down Ctrl while you drag.
3. To change how the object looks, double-click it to open the object's Properties dialog box.
4. Select rectangle or square options.

   For information about the options in the dialog box, see Help.
5. To close the dialog box, click OK.

You can use the Polygon tool to reshape the rectangle into a polygon. For more information, see page 20-43.

Creating rounded rectangles and squares

Due to a Windows limitation, you cannot rotate rounded rectangles and rounded squares.

To create a rounded rectangle or square

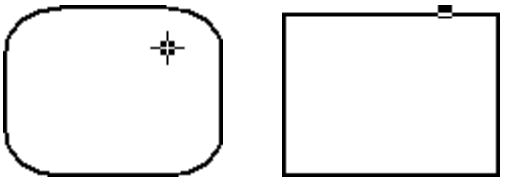
1. Select the Rounded Rectangle tool.

Rounded rectangle tool

2. Click the mouse where you want to position the object, and then drag until the rectangle or square is the size you want.

   To draw a square, hold down Ctrl while you drag.

3. You can change how rounded the corners are by using the handle that appears inside the rounded rectangle. Click the handle and drag inward to increase roundedness, or outward to decrease roundedness.



4. To finish drawing, click the object.
5. To change how the object looks, click Properties on the context menu, or double-click the object to open its Properties dialog box.
6. Select rounded rectangle or square options.

   For information about the options in the dialog box, see Help.

7. To close the dialog box, click OK.

For information about using the Rounded Rectangle tool to reshape the rounded rectangle, see page 20-44.

Using .wmf and .dxf files

Windows metafiles (.wmf) and AutoCAD® (.dxf) files are converted to drawing objects (such as lines, ellipses, and polygons) when you import them. You can edit the drawing objects the same way you edit drawing objects that you create in FactoryTalk View.

Depending on the complexity of the metafile or AutoCAD file, the converted image could consist of 500 or more drawing objects. This would lead to long display load times. In this case, it would be better to covert the .wmf or .dxf file to a bitmap, and then display the bitmap in an image object.

To place a .wmf or .dxf file in a display

1. On the Objects menu, click Import.
2. Click the mouse where you want to position the file, and then drag to draw a rectangle.
3. In the “Files of type” box, select the type of file to import.
4. Navigate to the directory where the file is stored, and then click the file to import.
5. Click Open.

   The file is converted to drawing objects and grouped, and then the grouped object is placed in the graphic display.

Using ActiveX objects

ActiveX objects use tags or expressions to exchange information with the data source.

The properties and connections available for a particular ActiveX object depend on the third-party vendor’s implementation.

ActiveX objects support visibility animation only.

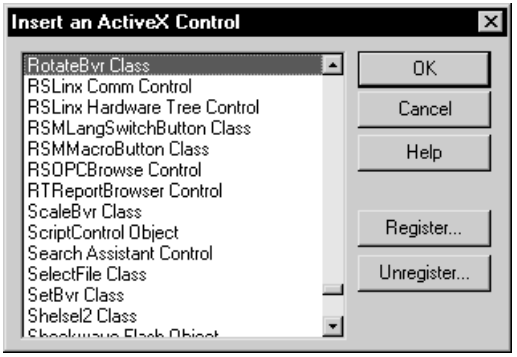
If your application will run on a PanelView Plus CE terminal, the ActiveX object must be available for both the development system (running on Windows 7 Professional, XP Professional, Server 2003 R2, Vista or Server 2008) and the PanelView Plus CE terminal platform. Make sure you install and register the Windows CE version of the ActiveX object on the PanelView Plus CE.

PanelView Plus terminals do not support ActiveX objects.

To create an ActiveX object

ActiveX Control tool

1. Select the ActiveX Control tool.
2. Click the mouse where you want to position the object, and then drag until the object is the size you want.



3. In the dialog box that opens, select the object to add to your graphic display.

   For information about the options in the dialog box, see Help.

4. Click OK.

   The object is placed in the display. Depending on how the third party implemented the object, it might be a different size than the rectangle you drew.

5. To specify the object's properties and assign tags or expressions to its connections, do one of the following:

   - Right-click the object, and then click Properties to open the object's Properties dialog box.

     Depending on how the third party implemented the object, it might not have a Properties dialog box. If the Properties menu item is not available, use the next method.

   - Right-click the object, and then click Property Panel.

6. In the Properties dialog box or Properties tab of the Property Panel, specify the object's properties.

7. If desired, set up the properties in the Common tab, as described on page 21-2.

8. In the Connections tab, assign tags or expressions to the object's connections.

9. To close the Properties dialog box, click OK. To close the Property Panel, click the Close button.

For information about using the Properties dialog box, see page 20-26. For information about using the Property Panel, see page 20-29.

Tools and tips for working with objects

This section describes features of the Graphics editor that help you work with the objects you create. It describes how to:

- select and deselect objects.
- use the Object Explorer to view and select objects.
- use an object's Properties dialog box to set up the object's properties and assign tags and expressions to its connections.
- use the Property Panel to set up individual and group object properties, and to assign tags and expressions to individual objects' connections.
- color objects.
- name objects.
- test how objects look in different states.

Selecting and deselecting objects

To work with an object, you must first select it. You can use the Select tool or the Object Explorer to select objects.

For information about using the Object Explorer, see page 20-24.

To select the Select tool

Select tool

- On the Objects menu, click Select, or on the Objects toolbar click the Select tool.

  The mouse pointer changes to a single arrow.

Selecting objects

To select	Do this
An object or group of objects	Click the object or group. In the Object Explorer, click the object or group.
An object within a group of objects	Double-click the group, and then click the object. In the Object Explorer, open the group, and then click the object.
Several objects	Click the first object, and then Ctrl-click additional objects.
All objects in an area	Click and drag diagonally to draw a selection border around the objects. Ctrl-click objects outside the border to add them to the selection.

To select	Do this
All objects in the drawing area or in a group you are editing	On the Edit menu, click Select All, or press Ctrl+A.

Deselecting objects

To deselect	Do this
An object	Ctrl-click the object.
Several objects	Press and hold Ctrl, and then drag a selection border around the objects.
All selected objects	Click in the Drawing area, away from any objects.

Using the Object Explorer

Use the Object Explorer to view and select objects from a tree-list of all the objects in a display. Groups are listed as expandable items in the tree, with a + icon.

Use the Object Explorer to select an object that is hidden behind other objects in the display, without bringing the object to the front. Objects are listed in front-to-back order. The object you created most recently is at the front, unless you move it back using the Send to Back option. For more information about layering objects, see page 20-48.

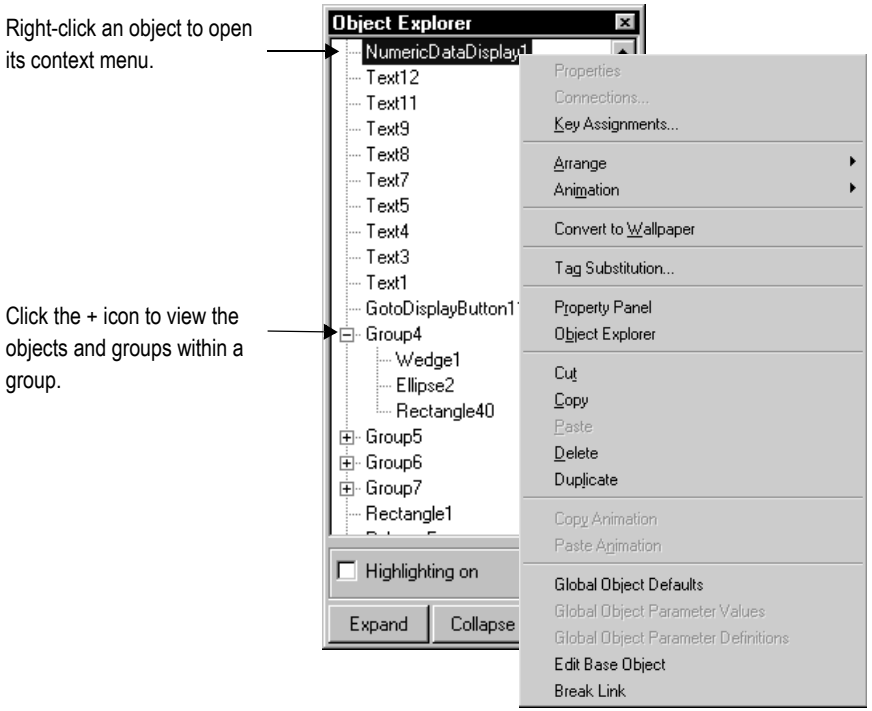
You can also use the Object Explorer to highlight objects by object type, highlight objects that have animation attached, and to highlight objects with specific tag or expression assignments. For more information, see page 20-25.

The Object Explorer does not show wallpaper objects, nor objects within ActiveX composite objects.

Show/Hide Object Explorer tool

To open the Object Explorer, use one of these methods

- On the Graphics toolbar, click the Object Explorer tool.
- On the View menu, click Object Explorer.
- Right-click an object, and then click Object Explorer.



You can keep the Object Explorer open as you work in the Graphics editor. For more information about using the Object Explorer, see Help.

Highlighting objects in the Object Explorer

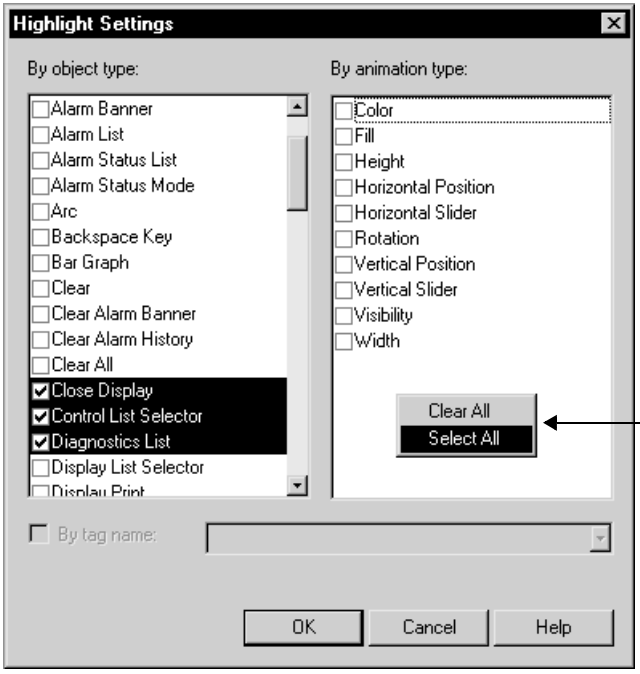
You can use the Object Explorer to highlight:

- specific types of objects
- objects that have animation attached
- objects that have a specific tag or expression assigned to them

The objects are highlighted in red in the Object Explorer and in the graphic display. If your graphic display uses a red background, the highlighting is not visible in the graphic display.

To highlight objects in the Object Explorer

- In the Object Explorer, click Highlighting on, and then click Settings.



To clear all the check boxes, right-click the list and then click Clear All.

To select all the check boxes, right-click the list and then click Select All.

For details about the options in the Highlight Settings dialog box, see Help.

Using the Properties dialog box

Every graphic object has a Properties dialog box that you can use to set up the object. Depending on how the vendor implemented the object, third-party ActiveX objects might have a Properties dialog box as well.

The Properties dialog box contains tabs that you can use to set up the object's properties and connections:

In this tab	Do this
General	Set up the object's appearance, audio indicator, and touch margins (for buttons), and settings that are unique to the object, such as the button action for a push button, whether to use key navigation to select the object, or whether to link a button to a specific object. For information about touch margins, see page 21-4. For information about key navigation, see page 21-8. For information about linking buttons to objects, see page 21-9.
States	Set up the states for the object, including the value for each state and whether to display a caption or image for the state. For information about checking that the states are set up the way you intended, see page 20-33.
Label	For objects that don't have multiple states, specify whether to use a caption or image on the object. For information about using the Image Browser to select an image to use in the label, see page 19-23.
Timing	Set up the object's auto repeat (see page 21-11) or Enter key handshaking (see page 21-12) settings.
Common	Set up the object's spatial properties, name and visibility. For details, see page 21-2.
Connections	Assign tags and expressions to the object's connections. For information about assigning tags and expressions, see page 20-34.

The tabs that are available depend on the object:

- Some objects have only General and Common tabs.
- If an object can have more than one state, the object's Properties dialog box contains a States tab.
- Some objects have unique tabs that are not listed in the table above.
- The tabs that an ActiveX object has depends on the vendor's implementation, though if you can assign tags or expressions to the object it has a Connections tab.

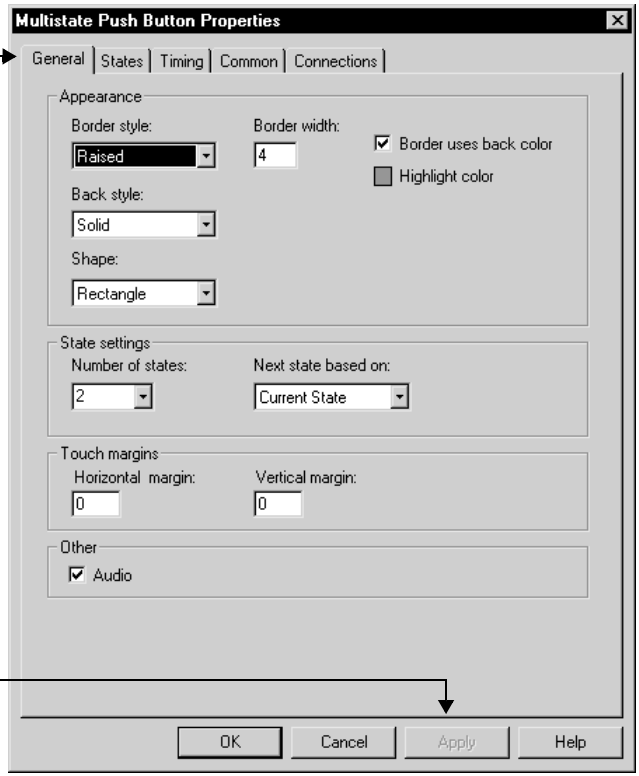
To open an object's Properties dialog box, use one of these methods

- Double-click the object.
- Right-click the object, and then click Properties.
- Select the object, and then on the Edit menu, click Properties.
- In the Property Panel, with the object selected, click the (Custom) property and then click the Browse button.

Browse button

- In the Property Panel, with the object selected, double-click the (Custom) property.
- In the Object Explorer, double-click the object.

Click a tab to select it.



This button is available once you make changes in the dialog box. Click it to apply your changes without closing the dialog box. When you click a different tab, the changes in the current tab are applied automatically.

You can also use the Property Panel to set up an object's properties, as described next.

For details about setting up a particular object, see Help.

Using the Property Panel

Use the Property Panel to modify the properties of graphic objects and assign tags and expressions to the objects.

The Property Panel is especially useful for making changes to the properties of multiple objects at the same time.

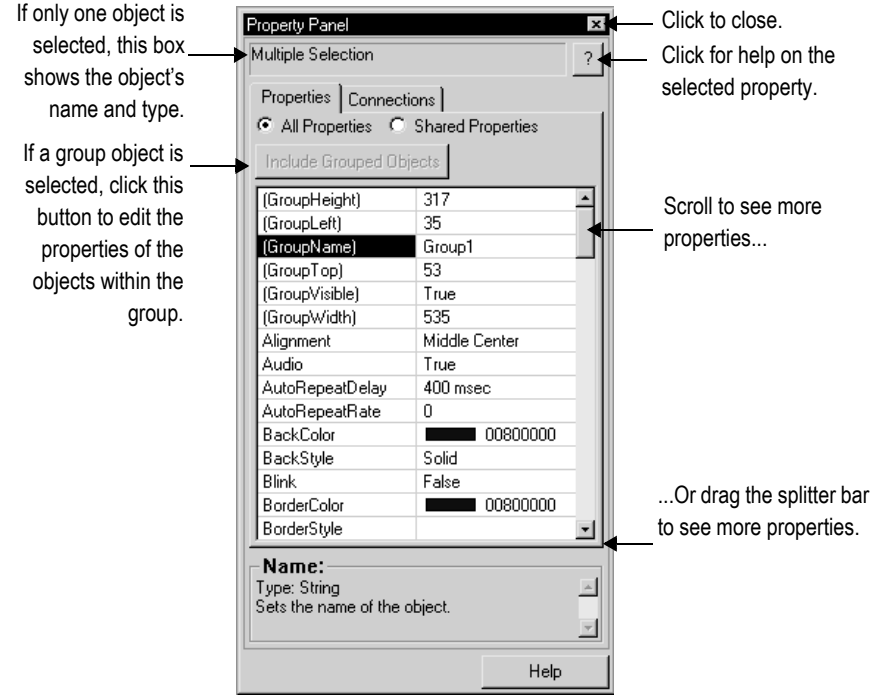
To open the Property Panel, use one of these methods

Show/Hide Property Panel tool

- On the Graphics toolbar, click the Property Panel tool.
- On the View menu, click Property Panel.
- Right-click an object, and then click Property Panel.
- Right-click an empty area of the display, and then click Property Panel.

Setting up properties

Use the Property Panel's Properties tab to set up the properties of the selected object or objects.



You can keep the Property Panel open as you work in the Graphics editor. You can drag the panel's borders to make the Property Panel larger or smaller.

For more information about using the Property Panel to set up an object's properties, see Help.

Assigning tags and expressions to an object's connections

Use the Property Panel's Connections tab to assign tags or expressions to the selected object's connections. If multiple objects are selected the tab is blank, because you can assign tags or expressions to only one object at a time.

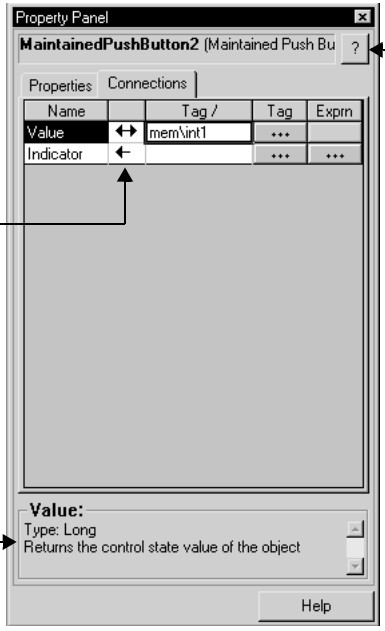
How values are updated

The arrows indicate the direction in which the data flows between the connection and the data source:

- A right arrow indicates that the connection sends values to the data source. The connection is a write connection.
- A left arrow indicates that the data source sends values to the connection. The connection is a read connection.
- A double arrow indicates that the data flows in both directions. The connection is a read-write connection.

The arrows show the direction in which data flows between the connection and the data source. If the connection is a read connection (arrow points left), data flows from the data source to the object. If the connection is a write connection (arrow points right), data flows from the object to the data source. If the connection is a read and write connection (double-headed arrow), data flows in both directions.

This box describes the selected connection and indicates the type of data the connection uses.



Click for help on the selected connection.

For more information about using the Property Panel to assign tags and expressions to an object's connections, see Help.

For more information about assigning tags and expressions to objects, see page 20-34.

Coloring objects using the color toolbars

The Foreground Color and Background Color toolbars contain a selection of colors you can assign to objects' color properties.

About color properties

The number of color properties an object has depends on the type of object and how you set it up. For example, a button with states can use up to seven different colors for each state. When you select colors using the color toolbars, some properties are assigned the foreground color and some are assigned the background color. Other color properties, such as Fill color, cannot be assigned using the color toolbars (instead, use the object's Properties dialog box or the Property Panel).

This table lists the color properties you can assign using the color toolbars:

Property	Foreground color	Background color
Back color	No	Yes
Background color	No	Yes
Border color	Yes	No
Caption color	Yes	No
Caption back color	No	Yes
Fore color	Yes	No
Foreground color	Yes	No
Image color	Yes	No
Image back color	No	Yes
Legend color	Yes	No
Needle color	Yes	No
Pattern color	Yes	No

For objects with states, the selected color is applied to the current state's color properties only. In the Property Panel, properties that apply to states have "St_" at the beginning of the property name.

When to select colors using the toolbars

For all the drawing objects except image and panel, you can select colors from the color toolbars before you draw an object (either before or after you click the object's tool).

The other objects are always drawn using their default colors, but you can select the objects and then click the toolbars to change their colors. The toolbars are especially useful for quickly assigning the same colors to multiple objects.

To display a color toolbar

- On the View menu, select Toolbars, and then click Foreground Colors or Background Colors.

To close a color toolbar

- On the View menu, select Toolbars, and then click Foreground Colors or Background Colors, or click the toolbar's Close button.

Other methods for assigning colors

You can also assign colors using an object's Properties dialog box or the Property Panel. Use one of these methods if you want to assign separate colors to different foreground or background color properties, or to choose colors that don't appear in the toolbars.

For example, if you want to use a dark blue background color for a button, with a light blue background color for its image label, you must assign the colors separately. Using the toolbar would assign the same color to both properties.

Also use the Properties dialog box or Property Panel to change the default colors for properties that cannot be assigned using the color toolbars.

Naming objects

Objects (and groups of objects) are automatically given a name and number when you create them, for example NumericInputEnable4. If desired, you can assign a more meaningful name to the object, for example Conveyor_speed_input. Each object in a display must have a unique name.

The object name appears in the status bar, Diagnostics List, Property Panel, and Object Explorer in FactoryTalk View Studio, and in diagnostics log messages at run time.

To name an object in the Property Panel

1. Select the object.

2. In the Property Panel, click the Properties tab.
3. Double-click the (Name) row, and then type the name.

   The name must start with a letter, and cannot contain spaces. You can use the underscore character (_).

To name an object in its Properties dialog box

1. Double-click the object to open its Properties dialog box.
2. Click the Common tab.
3. In the Name box, type the name.

The name must start with a letter, and cannot contain spaces. You can use the underscore character (_).

To name a group object

1. Select the group object.
2. In the Property Panel, click the Properties tab.
3. Double-click the (GroupName) row, and then type the name.

The name must start with a letter, and cannot contain spaces. You can use the underscore character (_).

Testing how objects look in different states

To make sure the different states for an object are set up correctly, you can view them using the States toolbar or the Property Panel.

To open the States toolbar

- On the View menu, select Toolbars, and then click States.

To view an object's states using the States toolbar

1. Select one or more objects.
2. In the States toolbar, select the state to view.

   If you selected multiple objects, the toolbar shows the states that are common to all the objects.

3. To view the next state, select it in the toolbar or press the Down Arrow key on your keyboard.

   You can also use these keys to select the next state to view:

   - To view the previous state, press the Up Arrow key.
   - To view the first state, press the Home key.
   - To see the last state, press the End key.

To view an object's states using the Property Panel

1. Select one or more objects.
2. In the Property Panel, click the State property and then select the state to view.
3. To view the next state quickly, double-click the row, or press the Enter key on your keyboard.

Assigning tags and expressions to graphic objects

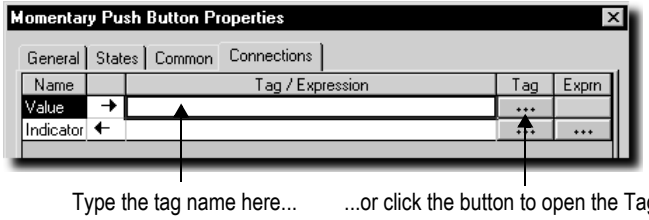
You can assign tags and expressions to many graphic objects, including ActiveX objects (depending, of course, on how the vendor implemented the object). This section describes how to:

- assign tags to graphic objects.
- use expressions to manipulate tag values.
- replace tags using tag substitution.
- use tag placeholders so the same display can be used with different sets of tags.

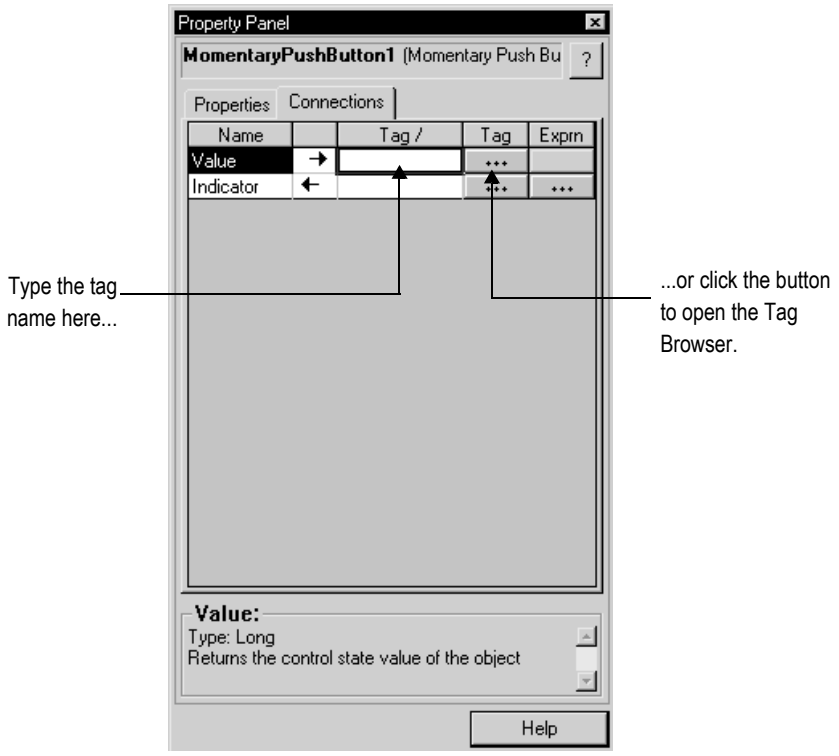
Assigning tags

To assign tags to a graphic object, use one of these methods:

- Double-click the object to open the object's Properties dialog box, and then assign tags in the Connections tab.



- Select the object and then assign tags in the Connections tab of the Property Panel.



- Select the object, and then on the Edit menu click Connections. Assign tags in the Connections tab of the Properties dialog box.
- Right-click the object, and then click Connections. Assign tags in the Connections tab of the Properties dialog box.

For information about:

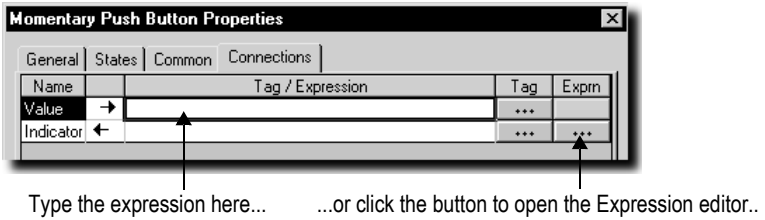
- using the Tag Browser, see page 6-6.
- using the Properties dialog box, see page 20-26.
- using the Property Panel, see page 20-29.

Using expressions to manipulate tag values

Many of the connections to which you can assign a tag also permit the use of expressions to perform logical or mathematical calculations on tag values. If you assign an expression,

FactoryTalk View monitors the expression value rather than the original tag value. For example, your machine might send values to the data source in the form of temperature in degrees Celsius. You could use an expression to convert the value to degrees Fahrenheit, and then monitor the expression result rather than the original tag value.

If you can assign an expression, a Browse button is present in the Exprn column in the Connections tab.



To specify an expression, do one of the following

- In the "Tag / Expression" column, type the expression.
- In the Exprn column click the Browse button and then create an expression in the Expression editor. Use this method if you want to check the expression syntax, or to use multiple lines for the expression.

For more information about expressions, see Chapter 23.

Replacing tags using tag substitution

You can replace tags assigned to the graphic objects in your display by using tag substitution. You can also replace the tags used in expressions assigned to graphic objects.

For example, if you assign a tag called HoistHeight to multiple objects in the display, and then decide to use the tag Hoist_height instead, you can use tag substitution to quickly replace the old tag with the new tag.

You can replace:

- a tag name (with or without folder names).
- a folder name.
- the text in an expression.
- tags contained in embedded variables.

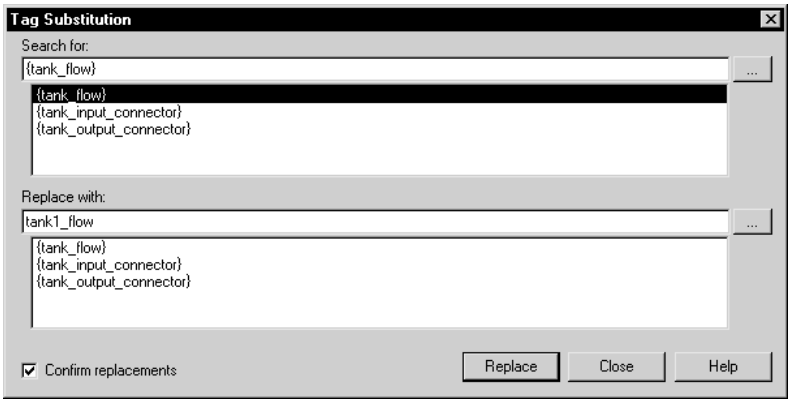
To replace tags

1. Select one or more objects.

To select all the objects in the display, on the Edit menu, click Select All.

2. On the Edit menu, click Tag Substitution.

   To replace the tags for a single object, you can right-click it and then click Tag Substitution.



For details about the options in the Tag Substitution dialog box, see Help.

A log file is displayed after substitution. It provides details on the substitution process and results. If the substitution fails, the reason will be shown. The last line shows where the log file is located in case you want to review it in the future.

Using tag placeholders

Tag placeholders provide a way to use one graphic display to represent a number of similar operations.

For example, suppose you are creating displays for a plant that cans corn and peas. The machinery used in both processes is identical. Instead of creating two displays and specifying corn-related tags in one display and pea-related tags in another, you can create one display and not specify any tag names. Where a tag name is required, type a tag placeholder.

You can use tag placeholders wherever you would normally assign a tag to an object, including in expressions and embedded variables. You can also use tag placeholders in the expressions you create to animate objects.

You can also use tag placeholders with global objects. For more information, see Chapter 25.

You can use tag placeholders in:

- the graphic display that opens when the application is first run.
- graphic displays that are opened using a goto display button.
- graphic displays that are opened using a display list selector.
- the graphic display that opens when the logout button is pressed to log the logged-on user out.
- the graphic display specified in the Project Settings Runtime tab when auto logout is enabled.
- graphic displays that are opened using the Remote Display Number global connection.

Use parameter files or parameter lists to specify which tags or folders to substitute for which placeholders. For global objects, you can specify the tags or folders of tags using global object parameters. For more information about using parameter files, parameter lists, and global object parameters, see Chapter 25.

Creating tag placeholders

A tag placeholder is the cross-hatch character (#) followed by a number from 1 to 500.

The tag placeholder can replace any part of a tag name, including folder names. For example, you could create a parameter file specifying that the tag placeholder #1=Folder1. You could assign the folder and a tag name to a graphic object's connection: #1\Tag1.

You can assign tag placeholders in:

- the Connections tab of an object's Properties dialog box.
- the Connections tab of the Property Panel.
- the Expression box in the Animation dialog box.
- anywhere that you can insert an embedded variable. For information about embedded variables, see Chapter 24.

To create a tag placeholder

- Type the cross-hatch character followed by a number (no space in between). For example, #1.

Performing basic operations on objects

Once you have drawn an object, you can select the object and work with it. You can:

- move objects.
- copy objects.

- duplicate objects.
- resize objects.
- reshape drawing objects.
- delete objects.

Moving objects

You can move objects using the mouse or the keyboard. The keys give you fine positioning, allowing you to move objects in small increments. You can also use the grid to position objects precisely.

Another option is to position an object using the object's Top and Left properties in the Property Panel. For information about using the Property Panel, see page 20-29.

You can also specify an object's position using the Common tab in the object's Properties dialog box. For more information, see page page 21-2.

Once you've moved objects into position, you might want to align other objects with them, or lock them into place. For information about aligning objects, see page 20-49. For information about locking objects into position, see page 20-53.

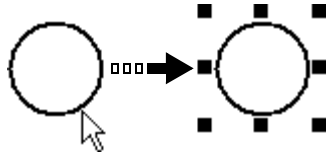
To automatically align objects to the grid as you move them

- On the View menu, select Snap On. A check mark appears beside the menu item when the option is selected.

For information about setting up the grid, see page 19-8.

To move objects by dragging with the mouse

1. Select one or more objects.
2. Place the pointer on an object (not on the edge or on the handles).
3. Drag the objects to the desired position.



Select the object. Drag the object to the desired position.

If you selected several objects, dragging one of the objects moves all the selected objects. The objects maintain their position relative to each other.

To move objects in small increments using the keyboard

1. Select one or more objects.
2. Place the pointer on the object, not on its edge or handle.
3. Hold down Shift while you press an arrow key.

   To adjust the amount of the increment, first hold down the Shift key and press the + or - keys on the keyboard's numeric keypad.
4. Release the Shift key when the object is in place.

Copying objects

To copy objects, you can:

- drag and drop objects in the same display.
- drag and drop objects between displays, or from a graphic library to a display.
- copy and paste objects.

When an object is copied, any animation attached to the object is also copied. If a group is copied, the new copy of the group can be ungrouped to individual objects, just like the original.

Copying objects with multiple languages

If an object has multiple language strings set up, copying the object copies all the languages. If the object is pasted into an application with different languages, only the strings for languages that are used by the application are pasted. If the new application has languages that are not set up for the object, those language strings are undefined and will be displayed with single question marks.

For more information about setting up multiple languages, see Chapter 12.

To copy objects in the same display

1. Select one or more objects.
2. Drag the object, and then press Ctrl.

   When you press Ctrl, a plus sign is added to the cursor.
3. When the object is where you want it, release the mouse button and then the Ctrl key.

   A new copy of the object is created.

   If you selected several objects, dragging one of the objects copies all the selected objects. The objects maintain their position relative to each other.

To drag objects between displays

1. Open both displays (or a graphic library and a display).
2. Position or resize the displays so both are visible.

   For more information, see page 19-13.
3. Select one or more objects.
4. Click the selected object and drag it to the new display.

   If you selected several objects, dragging one of the objects copies all the selected objects. The objects maintain their position relative to each other.

Copying and pasting objects

You can cut, copy, or paste objects using the menu items on the Edit menu or the buttons on the toolbar.

Once you cut or copy an object, you can paste it anywhere in the drawing area of:

- the same graphic display.
- a graphic display in the same or a different application.
- a graphic library in the same or a different application.

To cut or copy objects

Cut tool

Copy tool

1. Select one or more objects.
2. On the Edit menu, click Cut or Copy, or click the Cut or Copy tool on the Graphics toolbar.
   - To remove the original object, click Cut.
   - To retain the original object, click Copy.

To paste objects

Paste tool

1. Click in the display or library to paste to.
2. On the Edit menu, click Paste, or click the Paste tool on the Graphics toolbar.

Duplicating objects

When an object is duplicated, any animation attached to the object is also duplicated. If a group is duplicated, the new copy of the group can be ungrouped to individual objects.

To duplicate objects

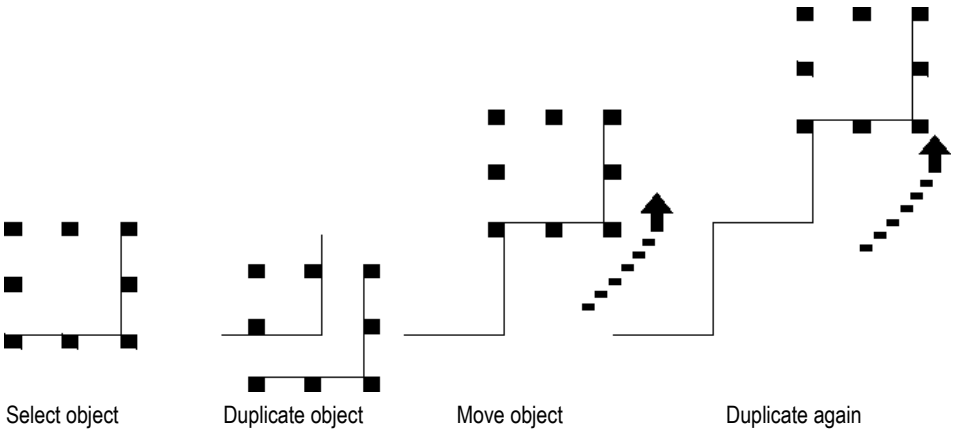
1. Select one or more objects.

Duplicate tool

2. On the Edit menu, click Duplicate, or click the Duplicate tool on the Graphics toolbar.

   The duplicated object is placed slightly offset from the original.

Duplicate also duplicates actions. For example, if you duplicate an object, move it, and then duplicate it again, the second Duplicate will, in one step, duplicate and move the object. This is useful for creating a series of objects with an equal distance between them.



Duplicate works until you deselect the object.

Resizing objects

You can resize objects using the mouse or using the keyboard. The keys let you resize objects in small increments. You can also use the grid to resize objects precisely.

Another option is to size an object using the object's Height and Width properties in the Property Panel. This method is especially useful for quickly resizing multiple objects to the same size. For information about using the Property Panel, see page 20-29.

You can also specify an object's size using the Common tab in the object's Properties dialog box. For more information, see page 21-2.

When you resize text objects, if you have selected the Size to fit option, the font size is adjusted to fit the new object size as closely as possible.

To automatically align objects to the grid as you resize them

- On the View menu, select Snap On. A check mark appears beside the menu item when the option is selected.

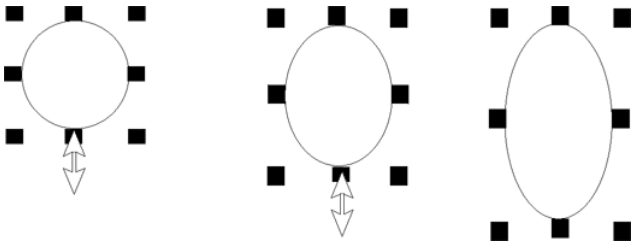
For information about setting up the grid, see page 19-8.

To resize an object using the mouse

1. Select the object.
2. Place the pointer on one of the handles.

   A double arrow appears.
3. Drag the handle until the object is the desired size or shape.

   Drag a side handle to change width or height, or a corner handle to change both.



   For perfect circles and squares, press Ctrl and hold the key down while you drag a corner handle.

   To maintain the object's original proportions (width to height), press Shift and hold the key down while you drag a corner handle.

To resize an object in small increments using the keyboard

1. Select the object.
2. Place the pointer on one of the handles.

   A double arrow appears.
3. Hold down Shift and press an arrow key until the object is the desired size.

   To adjust the amount of the increment, first hold down the Shift key and press the + or - keys on the keyboard's numeric keypad.

Reshaping drawing objects

You can reshape arcs, lines, polygons, polylines, rectangles, rounded rectangles, and wedges.

To reshape lines, rectangles, polylines, and polygons

Polygon tool

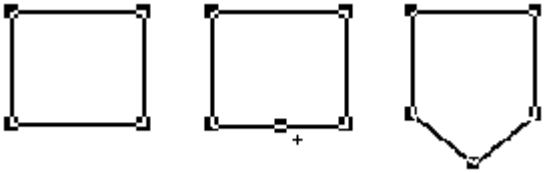
1. Select the object you want to reshape.
2. Click the Polygon tool, or right-click the object and then click Edit.

   The cursor changes to the Polygon tool, and handles appear on the object.

3. Move the cursor over any line or corner of the object.

   A handle with a cross-hair appears.

4. Drag the handle until the object is the desired shape.



   Dragging from a point along the line (between corners) creates a new angle between the two corners.

5. To delete an angle, position the pointer at the tip of the angle, and then press Delete.

To reshape arcs and wedges

1. Select the object you want to reshape.
2. Click the Arc or Wedge tool, or right-click the object and then click Edit.

Arc tool

   The cursor changes to the Arc or Wedge tool, and handles appear on the object.

3. Place the pointer on one of the handles.

Wedge tool

   A cross-hair appears.

4. Drag the handle until the object is the desired shape.

To reshape rounded rectangles

1. Select the rounded rectangle.
2. Click the Rounded Rectangle tool, or right-click the object and then click Edit.

Rounded rectangle tool

   A handle appears inside the rounded rectangle.

3. Click the handle and drag inward to increase roundedness, or outward to decrease roundedness.

Deleting objects

If you accidentally delete an object, use the Undo tool to restore it.

Undo tool

To delete objects

1. Select one or more objects.
2. On the Edit menu, click Delete, or press Delete on the keyboard.

To delete all the objects in the display

- On the Edit menu, click Clear All.

Working with groups of objects

Grouping and ungrouping objects

Grouping combines several objects into a single object so you can manipulate them as a single object. Grouping is useful for keeping objects in the same position relative to each other. You can cut, copy, and paste groups, arrange the group as a single object relative to other objects, and apply the same properties to all the members of the group at once.

You can attach animation to a group, and any animation attached to individual objects in the group remains active. The group animation generally takes precedence over the animation of individual objects within the group. For more information, see page 22-16.

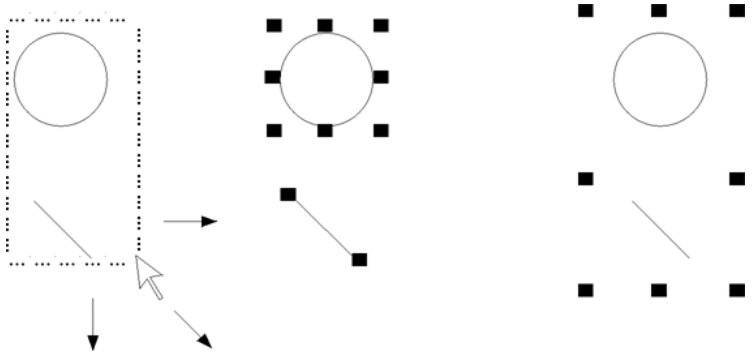
Deleting a group deletes all individual objects in the group.

To group objects

1. Select all the objects you want grouped.
2. On the Arrange menu, click Group, or on the Graphics toolbar click the Group tool.

Group tool

The handles around each object are replaced by a set of handles around the group.



Drag the mouse to select the objects.

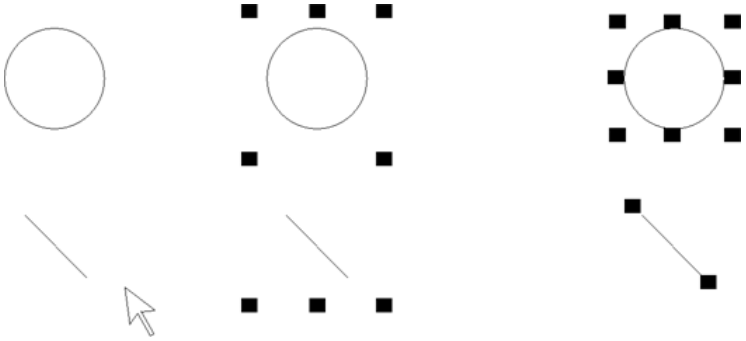
Group them.

To ungroup objects

1. Select the group of objects to ungroup.
2. On the Arrange menu, click Ungroup, or on the Graphics toolbar click the Ungroup tool.

Ungroup tool

The handles around the group are replaced with handles around each object.



Select the group. Ungroup it.

Ungrouping deletes any animation attached to the group, because the group no longer exists. However, animation attached to the individual objects that were in the group remains active.

Editing groups of objects

Edit a group the same way you would edit an individual object. You can:

- use the Property Panel to apply the same properties to all the members of the group at once. For example, change the line width of all objects in the group to 2 pixels.

  For information about using the Property Panel, see page 20-29.

- use the toolbars to apply the same pattern style, background style, foreground colors, and background colors to all the members of the group.

- for objects with states, use the States toolbar to cycle through the states and apply the same properties to the states for each object in the group at once. When you select a group containing objects with states, only the states that are common to all objects in the group appear in the toolbar.

  For more information about using the States toolbar, see page 20-33.

Editing objects within a group

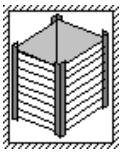
You can also edit individual objects within the group without breaking the group, which is particularly useful when you have animation attached to the group.

To edit objects within a group

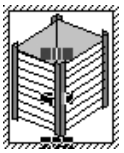
1. Double-click the grouped object, or right-click it and then click Edit. A hatched border appears around the group.

   When the hatched border is around the group, you are in group edit mode. In this mode, you can select individual objects in the group and modify them.

   You can also add new objects to the group.



Double-click to edit the group. A hatched border appears. This border indicates that this is a group.



Click again. Handles appear. The handles show the individual object selected within the group.

2. To select an individual object (or a group) in the group, click it. You can also use the Object Explorer to select objects within the group.

   The status bar and Object Explorer indicate which object or group is selected.

3. Make your changes to the object.

   You can change the selected object's shape, size, or position, or use the object's Properties dialog box or the Property Panel to edit the object's properties.

4. If desired, create new objects inside the hatched border.

5. To stop editing, click outside the group.

Arranging objects

You can arrange objects (or groups of objects) in a number of ways. You can:

- layer objects by moving them in front of or behind other objects.
- align objects with each other and with the grid.
- space objects horizontally or vertically.
- flip drawing objects horizontally or vertically.
- rotate drawing objects.
- lock objects into position.

Layering objects

You can layer objects (or groups of objects) on top of each other. Objects are layered in the order they are created, with the most recently created object on top. Change the layer order with Send to Back and Bring to Front.

Send to Back moves the selected object to the bottom layer.

Bring to Front moves the selected object to the top layer.

To bring an object to the front

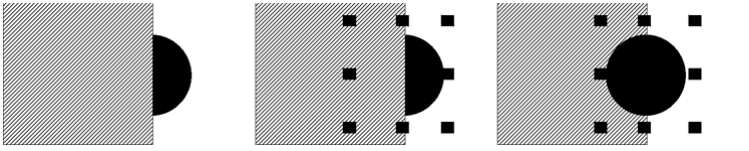
1. Select the object.

   To select an object that's behind another object, place your pointer on the front object, click once, pause, and then click again. Do not double-click and do not move the mouse.

   You can also select a concealed object easily by clicking the object in the Object Explorer.

2. On the Arrange menu, click Bring to Front, or click the Bring to Front tool.

Bring to Front tool

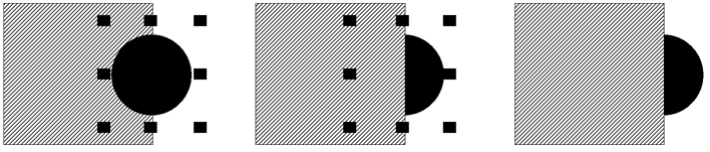


Select the object from behind. Bring the object to front.

To send an object to the back

1. Select an object.
2. On the Arrange menu, click Send to Back, or click the Send to Back tool.

Send to Back tool



Select the object. Send the object to back.

Aligning objects

You can align objects (or groups of objects) with each other and with the grid.

To align objects

1. Select the objects you want to align.
2. On the Arrange menu, click the appropriate menu item, or click a tool on the Alignment toolbar:

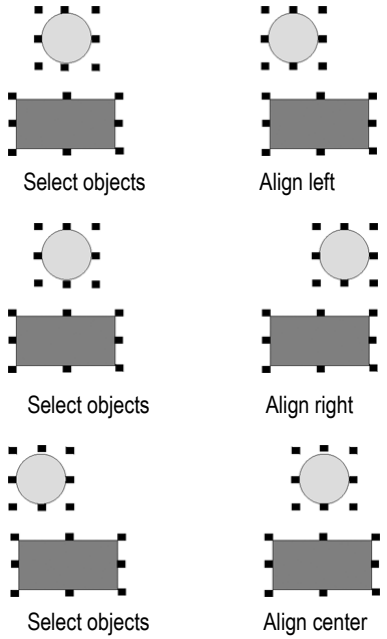
This button or menu item	Aligns selected objects with the
Align Left	Left-most selected object
Align Center	Horizontal center of all selected objects
Align Right	Right-most selected object
Align Top	Top-most selected object
Align Middle	Vertical center of all selected objects
Align Bottom	Bottom-most selected object
Align Center Points	Center of all selected objects
Align to Grid	Grid

To automatically align objects to the grid as you create or move them

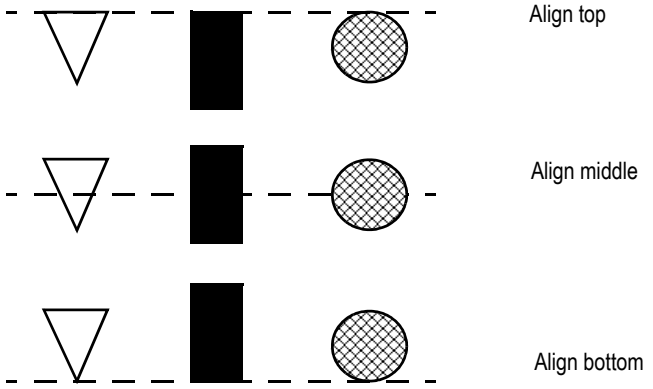
- On the View menu, select Snap On. A check mark appears beside the menu item when the option is selected.

For information about setting up the grid, see page 19-8.

Examples: Aligning objects left, right, and center



Examples: Aligning objects top, middle, and bottom



Spacing objects

With Space Vertical and Space Horizontal, objects (or groups of objects) are moved vertically or horizontally to have the same amount of space from the center point of each object.

To space objects

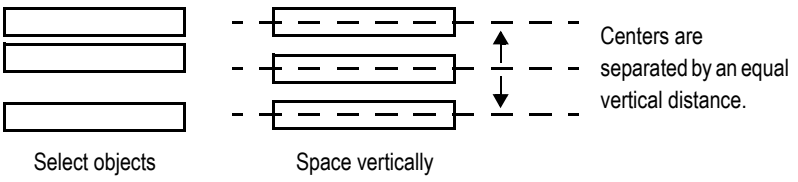
1. Select the objects you want to space.
2. On the Arrange menu, click a Space menu item, or click a tool on the Graphics toolbar:

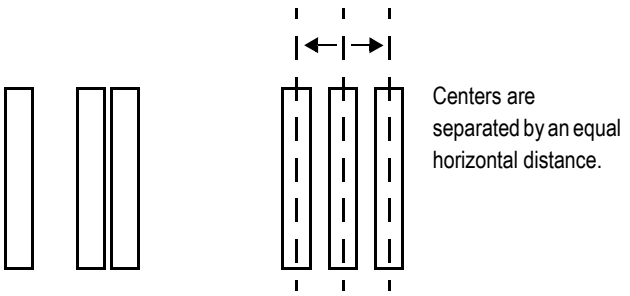
Space Horizontal tool

Space Vertical tool

This tool or menu item	Does this
Space Horizontal	Places the centers of the selected objects an equal distance apart horizontally.
Space Vertical	Places the centers of the selected objects an equal distance apart vertically.

Examples: Spacing objects vertically and horizontally





Flipping drawing objects

Flipping an object creates a mirror image of the object. You can flip all the drawing objects (or groups of drawing objects) except text, images, and panels.

To flip a drawing object

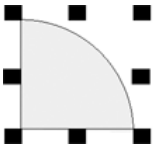
1. Click the object.
2. On the Arrange menu, click a Flip menu item, or click a tool on the Graphics toolbar:

Flip Vertical

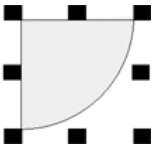
Flip Horizontal

This tool or menu item	Flips selected objects
Flip Vertical	Top to bottom (upside-down)
Flip Horizontal	Left to right

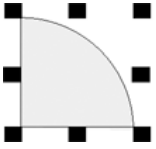
Examples: Flipping drawing objects vertically and horizontally



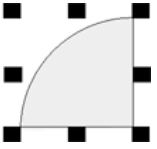
Select object



Flip vertical



Select object



Flip horizontal

Rotating drawing objects

You can rotate all the drawing objects (or groups of drawing objects) except images, panels, and rounded rectangles.

You can attach rotation animation to the same drawing objects. With rotation animation, the object rotates around an anchor point to indicate a tag's value at run time. For details about rotation animation, see page 22-14.

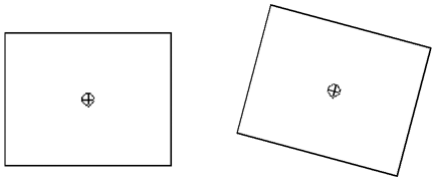
When you rotate text, it rotates around the anchor point but the text itself remains upright.

To rotate a drawing object

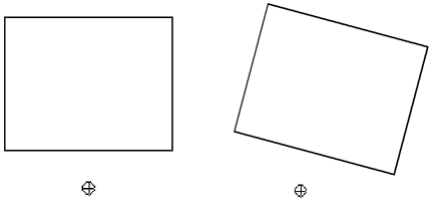
Rotate tool

1. On the Objects menu, click Rotate, or on the Objects toolbar click the Rotate tool.
2. Click the object you want to rotate. A small crosshair circle appears in the middle of the object. This is the anchor point that is used as the center of rotation.

   You can place the crosshair inside an object.



   You can place the crosshair outside an object.



3. To move the center of rotation, click the cross-hair and drag it to a new anchor position. The anchor can be inside or outside the object.
4. Click an edge of the object and drag in the direction you want to rotate it.

   To rotate the object in five-degree increments, press Ctrl while you drag.
5. When the object is in the desired position, release the mouse button.

Locking objects into position

You can lock graphic objects (or groups of objects) into position by converting them to wallpaper. Once you convert objects to wallpaper, you cannot select or edit them unless you unlock the wallpaper. Wallpaper objects cannot be animated at run time.

If the grid is on, wallpaper objects are positioned behind the grid.

If you just want to lock the objects into place while you're working in the display, unlock the wallpaper when you're finished. If you want to use the wallpaper objects as a background for your display, leave the wallpaper locked.

For more information about creating a background for your display, see page 19-13.

Setting up graphic objects

This chapter describes how to set up graphic objects. It describes how to:

- set up objects' spatial properties, names, and visibility.
- work with objects that have states.
- position objects for touch screens.
- assign function keys to buttons.
- use the keyboard to navigate to and select objects at run time.
- link buttons to lists and trends.
- repeat a button's action by holding down the button.
- ensure values are read by the data source before sending new values.
- set up objects.

For objects that are not described in other chapters of the manual, this chapter provides information about how to use the objects.

For information about creating graphic objects, see Chapter 20.

For information about creating and setting up the trend graphic object, see Chapter 28.

For information about creating and setting up the RecipePlus graphic objects, see Chapter 29.

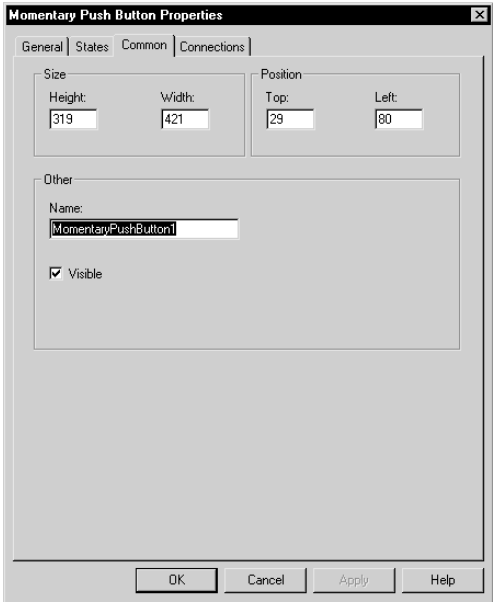
Setting up objects' spatial properties, names, and visibility

Every graphic object has a Common tab in its Properties dialog box. Use the Common tab to set up the following properties for the object:

- height and width
- top and left position
- name
- visibility

For ActiveX® and trend objects, you can also set up these properties:

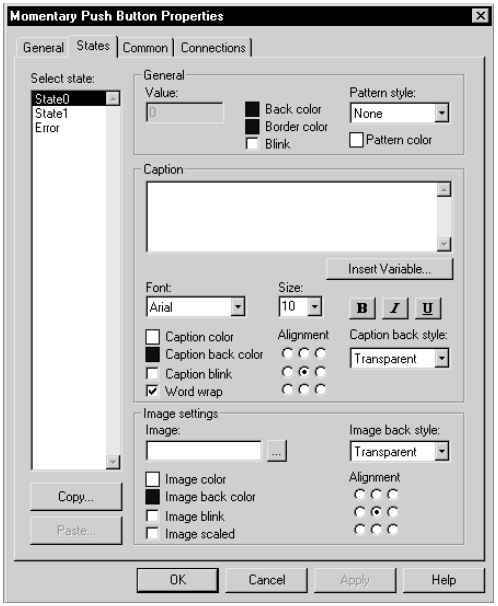
- focus highlight
- key navigation



For details about the options in the Common tab, see Help.

Tips for setting up objects with states

The graphic objects that have states have a States tab in their Properties dialog box.



For details about the options in the States tab, see Help.

Copying and pasting properties from one state to another

Often, you'll want most of the properties to be the same from state to state, with only one or two settings changing to distinguish the different states.

To simplify setting up states when many of the properties are the same, you can copy and paste settings from one state to another. For details, see Help.

Adding and removing states

Some graphic objects have a configurable number of states. For these objects, you can use the Insert State and Delete State buttons in the States tab, to add and remove states without returning to the General tab. The "Number of States" setting on the General tab is automatically updated.

For more information about the Insert State and Delete State buttons, see Help.

Setting up how objects are used at run time

Just as you must provide operators with a way to navigate between displays at run time, you must also make sure that operators can use the objects within the displays. The next sections in this chapter describe how to set up your objects so the operator can:

- press objects using a touch screen.
- use function keys to press buttons when a mouse or touch screen is not available on the run-time computer.
- use the keyboard or keypad to navigate to and select lists, trends, and ActiveX input objects.
- use buttons to work with lists and trends.
- repeat a button's action by pressing and holding it.
- ensure that tag values are read by the data source before sending new values.

Positioning objects for touch screens

If the operator will be using a touch screen at run time, keep these tips in mind when positioning graphic objects in your displays:

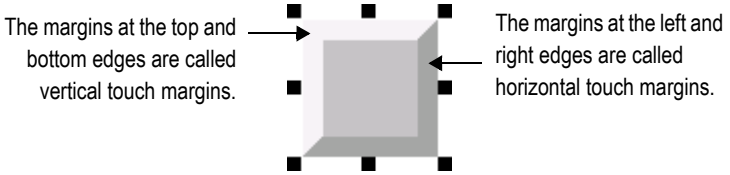
- Don't place important buttons where they'll be blocked by an On Top display. The user can't press a covered button.
- Ensure buttons are large enough for users to touch easily.
- Use touch margins for buttons that are positioned close together, to ensure that the adjacent button is not pressed by mistake.

Using touch margins

Touch margins are touch-insensitive borders inside the button's margin. If the operator presses on the touch margin, the button press is not registered. Touch margins are useful when buttons are positioned close to each other and you want to make sure the operator doesn't press the wrong button by mistake.

You can create touch margins at the top and bottom of the button, at the sides, or on all four sides.

In the illustration below, the button's border and touch margins are the same size, 12 pixels. A button press would be registered only when the darker square in the middle of the button is pressed.


The margins at the top and bottom edges are called vertical touch margins.
The margins at the left and right edges are called horizontal touch margins.

The bounding box

If the object's shape is a circle or ellipse, the touch margin applies to the object's bounding box, not the object's border. The bounding box is an invisible square or rectangle that surrounds the object. When you select the object, the selection handles show the location of the bounding box.

To create touch margins, use one of these methods

- In the General tab of the button's Properties dialog box, type the number of pixels for the touch margins in the Horizontal margin and Vertical margin boxes.
- In the Properties tab of the Property Panel, type the number of pixels for the HorizontalMargin and VerticalMargin properties.

Assigning function keys to buttons

You can assign function keys to the buttons in your displays to allow the operator to press the buttons using the function keys on the run-time terminal (or the function keys on a keyboard, if one is available). You can also assign a function key to the numeric input cursor point.

You can assign up to 34 function keys to each graphic display.

Here are some tips for assigning function keys:

- Where possible, use the same function keys for the same operations in all your graphic displays. For example, if every display contains a goto display button that returns the operator to a graphic display called Main Menu, assign the same function key to this button in each display.
- Include the name of the function key assigned to a button in a caption on the button.

For buttons with multiple states, include the function key name in the caption for each state, or create a text object to use as a label for the button (so that you don't have to set up the caption for each state), and then group the text and button together.

- If your application will run on a PanelView™ Plus or PanelView™ Plus CE terminal, assign keys that are supported by the run-time terminal. Different sizes of terminals have different function keys.

Function key equivalents

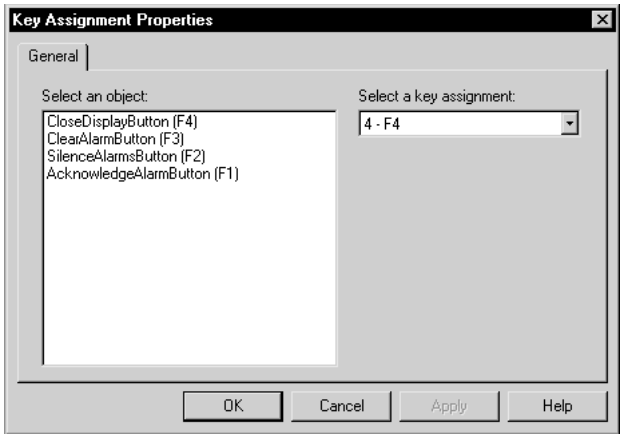
If your application will run on a personal computer, the keyboard contains the function keys F1 to F12 only. The remaining function keys are associated with these key combinations:

For this function key	Use this key combination
F13	Left Shift-F1
F14	Left Shift-F2
F15	Left Shift-F3
F16	Left Shift-F4
F17	Left Shift-F5
F18	Left Shift-F6
F19	Left Shift-F7
F20	Left Shift-F8
K1 - K12	Right Alt-F1 to Right Alt-F12
K13	Right Shift-F1
K14	Right Shift-F2
K15	Right Shift-F3
K16	Right Shift-F4
K17	Right Shift-F5
K18	Right Shift-F6
K19	Right Shift-F7
K20	Right Shift-F8

At run time, the operator presses the key combination to activate the object to which the function key is assigned.

To assign function keys to buttons

- On the Edit menu, click Key Assignments, or right-click a button and then click Key Assignments.



For details about using the Key Assignment Properties dialog box to assign function keys and change function key assignments, see Help.

Using the keyboard to navigate to and select objects

If a mouse or touch screen is not available on the run-time computer, the operator can use the keys on a keyboard or keypad to select (give focus to) these objects:

- lists: control list selector, piloted control list selector, display list selector, diagnostics list, alarm list, and alarm status list
- alarm banners
- trends
- numeric input enable buttons and string input enable buttons
- numeric input cursor points
- RecipePlus table and selector
- third-party ActiveX input objects

What input focus looks like

The object with focus is surrounded by a highlight box, unless the Disable Highlight When Object has Focus box is selected (in the Display Settings dialog box). You can specify the color of the highlight in this dialog box as well. For more information, see Help.

Focus highlight for ActiveX and trend objects

For ActiveX and trend objects, use the Common tab in the object's Properties dialog box to specify whether or not to display a highlight box. For more information about setting up options on the Common tab, see page 21-2.

If the Disable Highlight When Object has Focus box is checked (in the Display Settings dialog box), that setting overrides the setting you specify in the Common tab.

Using the keys on the keyboard or keypad

When a graphic display opens, the keyboard-navigable object that is closest to the top left corner of the display is selected. The operator can use these keys to move to and select a different object:

Use this key	To do this
Tab	Move from the upper left to the lower right.
Shift+Tab	Move from the lower right to the upper left.
Ctrl+arrow key	Move left, right, up, or down.

Removing objects from and adding objects to the tab sequence

By default, you can use the keys to navigate to all lists, alarm banners, numeric input cursor points, trends, and ActiveX input objects in a display. However, you can turn off key navigation for these objects if desired.

When an object's key navigation is turned off, the operator can still select the object using a mouse or touch screen, if available.

By default, key navigation is turned off for the numeric input enable buttons and string input enable buttons. You can turn on keyboard navigation if you want the operator to use the keyboard to navigate to these objects.

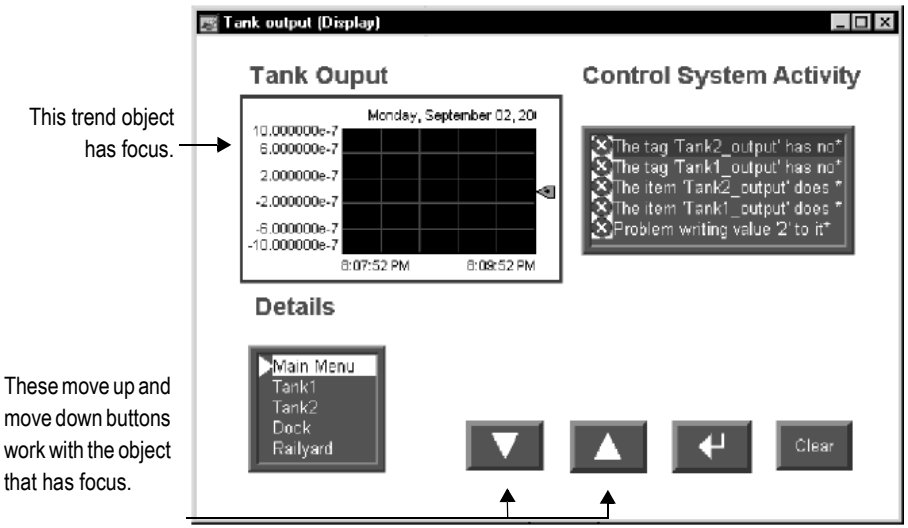
To turn key navigation on or off, use one of these methods

- In the Properties tab of the Property Panel, set the KeyNavigation property to False for off or True for on.
- For list objects, alarm banners, numeric input cursor points, numeric input enable buttons, and string input enable buttons, in the General tab of the object's Properties dialog box, clear the Key navigation box for off. Check the box for on.
- For ActiveX and trend objects, in the Common tab of the object's Properties dialog box, clear the Key navigation box for off. Check the box for on.

Linking buttons to objects

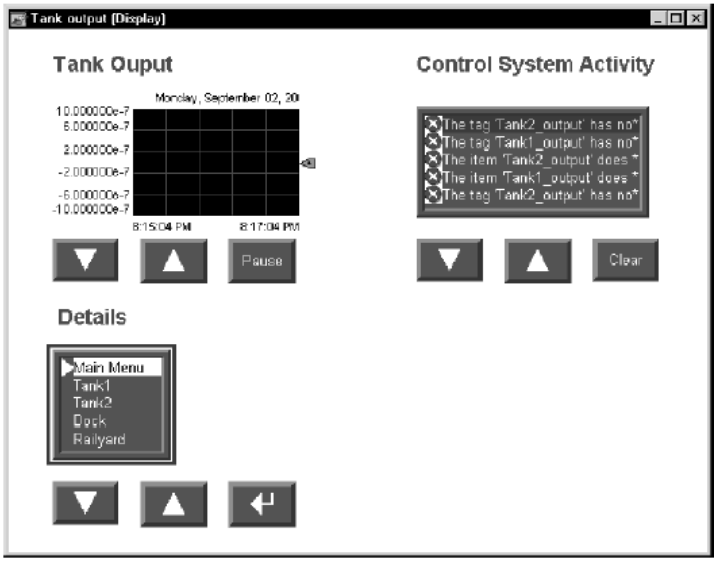
Some FactoryTalk® View buttons can be linked to specific trend, list, recipe, and alarm banner objects, or you can set them up to work with whichever object has focus in the display.

If you are creating small graphic displays, you might prefer to use one set of buttons to work with all the display's graphic objects that accept input focus.



By default, the buttons are set up to work with whichever object has input focus (is selected) in the display.

However, if space isn't a concern, you can create multiple copies of the buttons you want to use and link them to specific objects. One benefit of linking a button to a specific object is that the operator doesn't have to select the object before pressing the button. Another benefit is that you can position the buttons close to the specified object, making it easier for the operator to understand which buttons work with which objects.



Each object has its own set of buttons.

To link a button to a specific object using the button's Properties dialog box

1. Double-click the button to open its Properties dialog box.
2. In the General tab, in the "Send press to" box, select Linked Object.
3. To select from a list of all the objects in the display that you can link the button to, click the Browse button next to the Linked object box.
4. Click the name of the object to link the button to, and then click OK.
5. Click OK to close the button's Properties dialog box.

To link a button to a specific object using the Property Panel

- In the Properties tab, specify the SendPressTo and LinkedObject properties.

Once you have linked buttons to an object, you might want to turn off the object's key navigation, since this option is no longer needed. For details, see page 21-9.

Repeating a button's action by holding down the button

To repeat a button's action by pressing and holding it, set up auto repeat for the button. If you set up auto repeat, when the operator presses and holds down the button, repeated button presses are registered until the operator releases the button.

A button press occurs when the operator clicks an object with the mouse, presses it on a touch screen, or presses the function key associated with the object. Auto repeat works with all these methods of pressing buttons.

You can use auto repeat with these buttons:

For this button	Each button press does this
Multistate push	Sends the value for the next state to the data source. External changes to the Value connection are not recognized when the button is in auto repeat mode.
Ramp	Sends the new ramped value to the data source. External changes to the Value connection are not recognized when the button is in auto repeat mode.
Move up	Moves the highlight up an item in the list, recipe selector, or recipe table, scrolls up in the trend, or ramps the numeric input cursor point or numeric input enable button value.
Move down	Moves the highlight down an item in the list, recipe selector, or recipe table, scrolls down in the trend, or ramps the numeric input cursor point or numeric input enable button value.
Page up	Moves the highlight up a page in the list, recipe selector, or recipe table.
Page down	Moves the highlight down a page in the list, recipe selector, or recipe table.
Move left	Scrolls the trend to the left.
Move right	Scrolls the trend to the right.

For each button that uses auto repeat, you can specify these properties:

- Auto repeat rate—the number of times per second a button press is registered when the button goes into auto repeat mode. The default rate is 0, which means that auto repeat is turned off.

- Auto repeat delay—the length of time the button has to be pressed and held down before auto repeat starts.

To set up auto repeat for a button, use one of these methods

- In the Timing tab of the button's Properties dialog box, specify the Auto repeat rate and Auto repeat delay properties.
- In the Properties tab of the Property Panel, specify the AutoRepeatRate and AutoRepeatDelay properties.

Ensuring values are read by the data source before sending new values

To ensure a value is read by the data source before the operator sends a new value, use Enter key handshaking. While Enter key handshaking is in effect for an object, the operator cannot send a new value to the object's Value connection.

You can use Enter key handshaking with these graphic objects:

- control list selector
- piloted control list selector
- numeric input enable button
- string input enable button
- numeric input cursor point

If Enter key handshaking is in effect for one of these objects, the operator can still provide input to other objects in the graphic display.

If the graphic display is closed while Enter key handshaking is in effect, the handshaking is cancelled.

Methods of Enter key handshaking

Enter key handshaking works by setting the object's Enter connection to 1. As long as the Enter connection is set to 1, new values cannot be sent to the Value connection. How the Enter connection is reset to 0 depends on how you set up Enter key handshaking.

There are two ways you can use Enter key handshaking:

- to hold the value at the data source for a specific period of time.
- to hold the value at the data source until the data source notifies FactoryTalk View that the value has been read.

Choose the method that best suits your application needs and communication system.

Holding the value for a specific period of time

To set up an object's Enter key handshaking so that the value at the Value connection is held for a specific period of time, assign a tag to the Enter connection and specify the Enter key hold time. You can also specify an Enter key control delay, if desired.

How handshaking works

This method of Enter key handshaking works as follows:

1. When the operator presses the Enter button, the value is sent to the Value connection and the "Enter key control delay" timer begins timing. (The use of a delay is optional.)
2. If you specify an Enter key control delay, when the time is up, the Enter connection is set to 1. If you don't use the delay, the Enter connection is set to 1 as soon as the operator presses Enter.

   As long as the Enter connection is set to 1, the operator cannot send new values to the data source.
3. When the Enter connection is set to 1, the "Enter key hold time" timer begins timing.
4. When the Enter key hold time has expired, the Enter connection is reset to 0 and the operator can send a new value to the Value connection.

To set up Enter key handshaking to hold the value for a specific period of time

1. In Timing tab of the object's Properties dialog box, specify the Enter key control delay (optional) and Enter key hold time properties.
2. In the Connections tab, assign a tag to the Enter connection. A digital tag is recommended (either an HMI tag or a data server tag).

You can also use the Property Panel to specify the properties and assign a tag to the Enter connection.

Holding the value until it is acknowledged

To set up an object's Enter key handshaking so that the value at the Value connection is held until the data source notifies FactoryTalk View that it has read the value, use two connections: the Enter connection and the Enter handshake connection.

Instead of using an Enter key hold time, specify an Enter key handshake time. You must also specify the Handshake reset type. You can use an Enter key control delay, if desired.

How the Handshake reset type works

How the Enter handshake connection resets the Enter connection depends on which Handshake reset type you select:

With this handshake reset type	The Enter connection is set to 0 when
Non-zero Value	The Enter handshake connection has a non-zero value. If the Enter handshake connection already has a non-zero value when the value is sent to the Value connection (or when the Enter key control delay has expired, if the delay is used), then the Enter connection is not set to 1, and Enter key handshaking does not take place.
Zero to Non-zero transition	The Enter handshake connection changes from 0 to a non-zero value.

Set up the data source to send a non-zero value to the Enter handshake connection when it has read the new value at the Value connection, and then to reset the Enter handshake connection to 0.

If the Enter key handshake time expires before the Enter handshake connection resets the Enter connection, an error message is sent to FactoryTalk® Diagnostics.

How handshaking works

If you use the Enter handshake connection, handshaking works like this:

1. When the operator presses the Enter button, the value is sent to the Value connection and the "Enter key control delay" timer begins timing. (The use of a delay is optional.)
2. If you specify an Enter key control delay, when the time is up, the Enter connection is set to 1. If you don't use the delay, the Enter connection is set to 1 as soon as the operator presses Enter.

   As long as the Enter connection is set to 1, the operator cannot send new values to the data source.

   If the Handshake reset type is Non-zero Value, the Enter handshake connection must be 0 when the delay expires in order to set the Enter connection to 1.
3. When the Enter connection is set to 1, the "Enter key handshake time" timer begins timing.
4. The Enter connection remains set until the Enter key handshake time expires or until reset by the Enter handshake connection, whichever happens first.

5. The Enter connection is reset to 0 and the operator can send a new value to the Value connection.

To set up Enter key handshaking to hold the value until the data source has read it

1. In the Timing tab of the object's Properties dialog box, specify these properties:
   - Enter key control delay (optional)
   - Enter key handshake time
   - Handshake reset type
2. In the Connections tab, assign these connections:
   - Enter—assign a tag. A digital tag is recommended (either an HMI tag or a data server tag).
   - Enter handshake—assign a tag or expression.
3. Set up the data source to send a non-zero value to the Enter handshake connection when it has read the new value at the Value connection, and then to reset the Enter handshake connection to 0.

You can also use the Property Panel to specify the properties and assign tags to the connections.

Time, date, and number formats for graphic objects

Graphic objects use the time, date, and number format of the current application language. For example, if the application language uses a comma for the decimal symbol, floating-point values displayed in graphic objects uses a comma for the decimal symbol.

For information about using multiple languages, see Chapter 12.

Setting up buttons

Many of the button graphic objects are set up the same way. The instructions in this section apply to these buttons:

Acknowledge alarm	Logout
Acknowledge all alarms	Move down
Alarm status mode	Move left
Backspace	Move right
Clear alarm banner	Move up
Clear alarm history	Next pen
Diagnostics clear	Page down
Diagnostics clear all	Page up
Display print	Password
End	Pause
Enter	RecipePlus
Goto configure mode	Reset alarm status
Home	Return to display
Information acknowledge	Shutdown
Language switch	Silence alarms
Login	Sort alarms

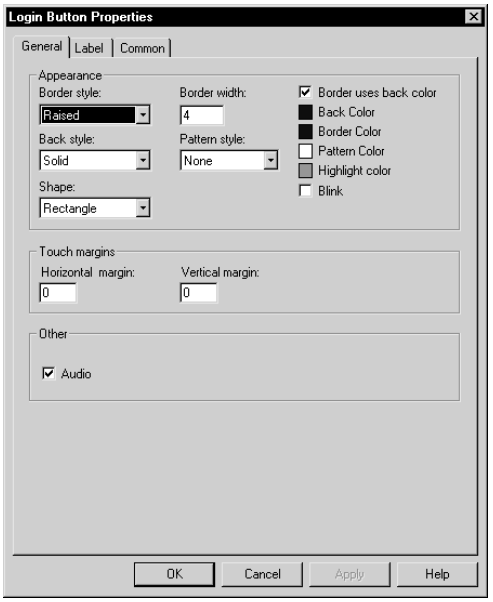
You can set up any combination of these buttons in a graphic display. For example, you might want to put a login, logout, and shutdown button in the same graphic display.

Create and then set up each button separately.

The illustration shows the login button. Some buttons have different properties on the General tab, but you can use these instructions to set up any of the buttons in the list. For example, on the General tab for the acknowledge all alarms button and the clear alarm history button, you can specify a subset of alarms to which the button's action applies. For details about filtering alarm triggers, see page 9-5.

To set up a button

1. Double-click the button.



2. In the button's Properties dialog box, fill in the options on each tab:

   - In the General tab, specify what the button looks like at run time. For some buttons, you can specify whether to link the button to a specific object. For the logout button, you can specify a display to open when the button is pressed, and whether the display will use a parameter file or list when it opens.
   - In the Label tab, specify what text or image to display on the button.
   - In the Timing tab, set up whether or not the button press repeats automatically when the operator presses and holds the button down. You can also set up the rate at which the button press repeats. For more information about auto repeat, see page 21-12.

     The Timing tab is available only for the move up, move down, move left, move right, page up, and page down buttons.
   - In the Common tab, specify the button's spacial properties, name, and visibility.

   For details about the options in the tabs, see Help.

3. When you are finished, click OK.

Buttons described later in the chapter

Information about setting up these buttons is described later in the chapter:

Close display	Multistate push
Goto display	Numeric input enable
Interlocked push	Print alarm history
Latched push	Print alarm status
Macro	Ramp
Maintained push	String input enable
Momentary push	

How to use push buttons

Push buttons start or stop processes or actions by changing tag values.

Never use push buttons for emergency stops. Emergency stop buttons must always be hard-wired.

You can use different kinds of push buttons, depending on what kind of machinery you are running or process you are controlling:

Momentary push buttons change a tag to one value when the button is pressed, and another value when the button is released. The machine is on only while the button is held down. When the button is released, the machine turns off. Momentary push buttons are useful for jogging a motor, and they can be set up to start and stop a machine or process.

Maintained push buttons toggle between two values. This type of button is useful for changing a setting within a machine or process, but not for starting the machine or process. For example, use the maintained push button for changing modes, such as Auto to Manual, or Metric to Imperial.

Latched push buttons latch in the on position, and must be unlatched by another button or process to return to the off position. This type of button is useful for starting a machine or process.

Multistate push buttons allow an operator to cycle through multiple options consecutively, using a single button. The current state of a process or operation is displayed on the button by a different color, caption, or image for each state.

Interlocked push buttons work in groups, and share the same tag. Pressing one button cancels another. Although interlocked push buttons work as a group, you add them to the display one at a time.

Ramp buttons increase or decrease the value of a tag by either an integer or floating-point value. You can use two ramp buttons together to create an increment/decrement control, for example for the speed of a motor. Or, you can use a numeric input enable button or numeric input cursor point.

For information about the numeric input enable button, see page 21-30. For information about the numeric input cursor point, see page 21-31.

Setting up momentary push buttons

Use the momentary push button to start a process or action. When pressed, the button changes a tag to one value, and when released, the button changes the tag to another value.

The momentary push button's states can perform one of three kinds of actions:

- Change the Value connection to 1 when the button is pressed, and to 0 when the button is released. This kind of button is called **normally open**, because its released state is off. Pressing the button completes the circuit.
- Change the Value connection to 0 when the button is pressed, and to 1 when the button is released. This kind of button is called **normally closed**, because its released state is on. Pressing the button breaks the circuit.
- Change the Value connection to a **value** you specify. You assign the desired values to the button's press and release actions. For example, 50 when pressed, and 100 when released.

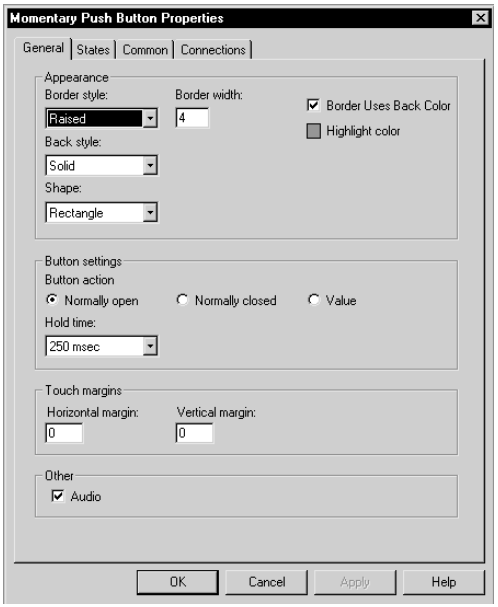
The error state

The button's error state is displayed at run time when:

- the Value connection is unassigned.
- the Indicator connection's value does not match one of the state values you set up.

To set up a momentary push button

1. Double-click the momentary push button.



2. In the button's Properties dialog box, fill in the options on each tab:

   - In the General tab, specify what the momentary push button looks like at run time, and what type of action the button performs.
   - In the States tab, specify what the button does when it is pressed and released. For tips about setting up states, see page 21-3.
   - In the Common tab, specify the button's spacial properties, name, and visibility.
   - In the Connections tab, specify the tags or expression with which the button exchanges data. For information about assigning tags and expressions, see page 20-34.

   For details about the options in the tabs, see Help.

3. When you are finished, click OK.

Setting up maintained push buttons

Use the maintained push button to change a setting in a machine or process. Maintained push buttons are not useful for starting or stopping a machine or process.

When pressed the first time, the maintained push button changes a tag to one value. When pressed and released a second time, the button changes the tag to another value.

The error state

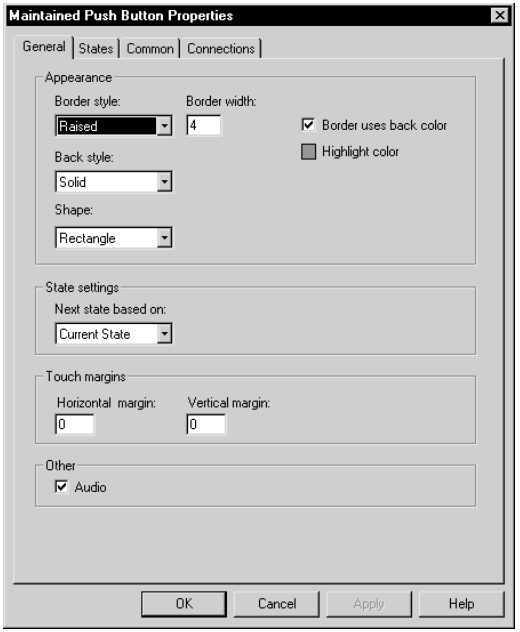
The button's error state is displayed at run time when:

- the Value connection is unassigned.
- the Indicator connection's value does not match one of the state values you set up.

The error state is also displayed when the display containing the maintained push button first opens, if the Value connection's value does not match one of the state values you set up.

To set up a maintained push button

1. Double-click the maintained push button.



2. In the button's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the button looks like at run time, and how the button changes state.
   - In the States tab, specify what the button does when it is pressed and released. For tips about setting up states, see page 21-3.
   - In the Common tab, specify the button's spacial properties, name, and visibility.
   - In the Connections tab, specify the tags or expression with which the button exchanges data. For information about assigning tags and expressions, see page 20-34.

   For details about the options in the tabs, see Help.
3. When you are finished, click OK.

Setting up latched push buttons

The latched push button latches in the On position, and must be unlatched by another button or process to return to the Off position. This type of button is useful for starting a machine or process.

For example, use the latched push button when you want the Value connection to start a process within a programmable controller and remain set until the process is completed. You can also use a latched push button when you have a controller with a long program or long update times.

When the operator presses a latched push button, it changes the Value connection to one value, and remains at that value until the Handshake connection gives the signal to unlatch the button.

The error state

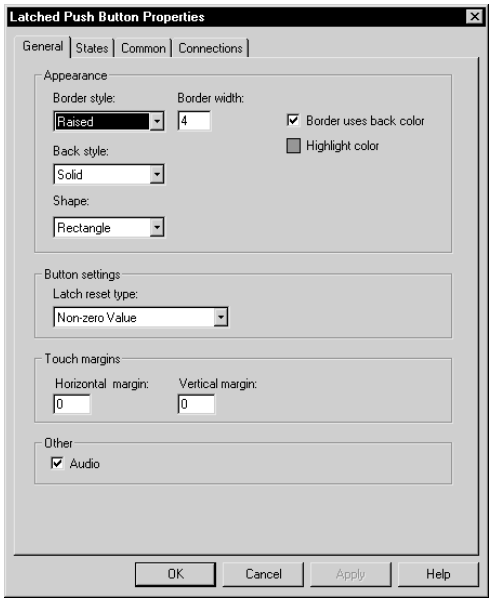
The button's error state is displayed at run time when:

- the Value connection is unassigned.
- the Indicator connection's value does not match one of the state values you set up.
- The Handshake connection is unassigned.

The error state is also displayed when the display containing the latched push button first opens, if the Value connection's value does not match one of the state values you set up.

To set up a latched push button

1. Double-click the latched push button.



2. In the button's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the button looks like at run time, and how to unlatch it.
   - In the States tab, specify what the button does when it is latched and unlatched. For tips about setting up states, see page 21-3.
   - In the Common tab, specify the button's spacial properties, name, and visibility.
   - In the Connections tab, specify the tags or expression with which the button exchanges data. For information about assigning tags and expressions, see page 20-34.

   For details about the options in the tabs, see Help.
3. When you are finished, click OK.

Setting up multistate push buttons

The multistate push button displays—and allows an operator to cycle through—multiple options consecutively. The multistate push button displays the current state of a process or operation by showing a different color, caption, or image to reflect different states.

Each time the operator presses the button, the tag changes to the value for the next state. When the button is in its last state and the operator presses the button, the button returns to its first state.

The error state

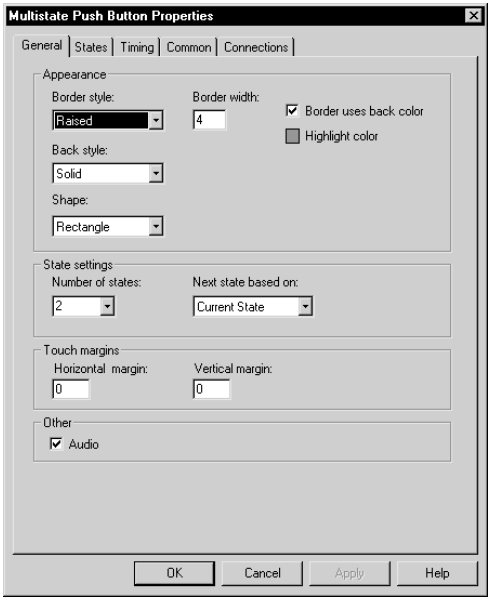
The button's error state is displayed at run time when:

- the Value connection is unassigned.
- the Indicator connection's value does not match one of the state values you set up.

The error state is also displayed when the display containing the multistate push button first opens, if the Value connection's value does not match one of the state values you set up.

To set up a multistate push button

1. Double-click the multistate push button.



2. In the button's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the button looks like, and how the button changes state.
   - In the States tab, specify what the button does when it is pressed and released. For tips about setting up states, see page 21-3.
   - In the Timing tab, set up whether or not the button press repeats automatically when the operator presses and holds the button down. You can also set up the rate at which the button press repeats. For more information about auto repeat, see page 21-11.
   - In the Common tab, specify the button's spacial properties, name, and visibility.
   - In the Connections tab, specify the tags or expression with which the button exchanges data. For information about assigning tags and expressions, see page 20-34.

   For details about the options in the tabs, see Help.
3. When you are finished, click OK.

Setting up interlocked push buttons

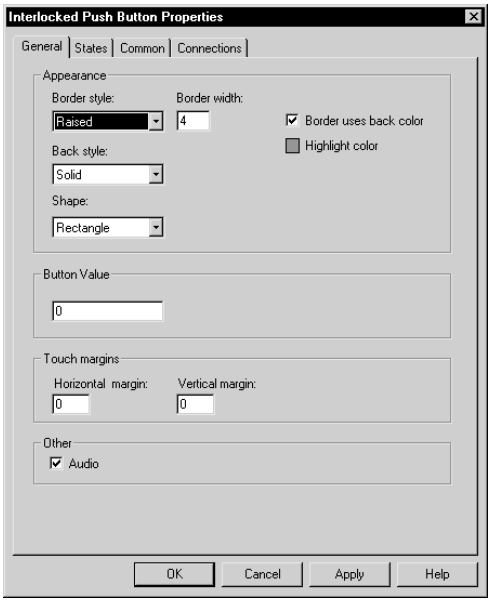
Multiple interlocked push buttons work together and share the same tag. Pressing one button cancels another. Although interlocked push buttons work as a group, you add them to the display one at a time.

When the operator presses one of the interlocked push buttons, the tag assigned to its Value connection changes to one value. When the operator presses a different interlocked push button, the tag changes to another value. Assign the same tag to each button's Value connection.

You can also use a single interlocked push button to send a value to a tag.

To set up an interlocked push button

1. Double-click the interlocked push button.



2. In the button's Properties dialog box, fill in the options on each tab:

   - In the General tab, specify the button's appearance, and the value it sends to the Value connection.
   - In the States tab, specify what the button looks like when it is pressed and released at run time. For tips about setting up states, see page 21-3.
   - In the Common tab, specify the button's spacial properties, name, and visibility.
   - In the Connections tab, specify the tag with which the button exchanges data. Interlocked push buttons have no Indicator connection. For information about assigning tags, see page 20-34.

   For details about the options in the tabs, see Help.

3. When you are finished, click OK.

Setting up ramp buttons

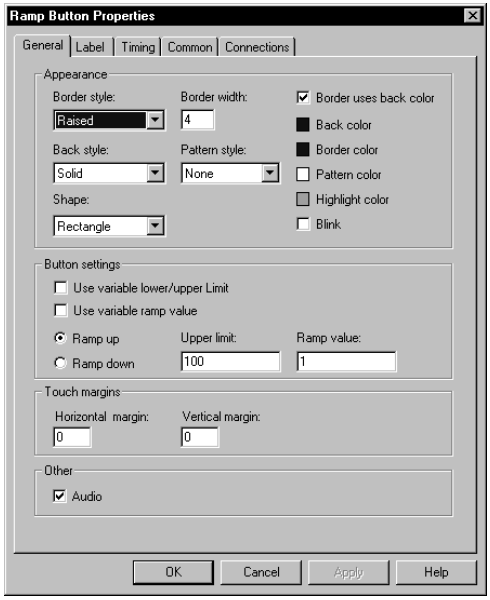
Use the ramp button to increase or decrease the value of a tag.

Ramp buttons can change a tag by either an integer or floating-point value. You can use two ramp buttons together to create an increment/decrement control.

Each time the operator presses the button, the tag value increases or decreases, depending on how you set up the button.

To set up a ramp button

1. Double-click the ramp button.



2. In the button's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the button looks like, whether the button uses variable or constant upper and lower limits and ramp value, and whether the button ramps a value up or down.
   - In the Label tab, specify what text or image to display on the button.
   - In the Timing tab, set up whether or not the button press repeats automatically when the operator presses and holds the button down, and the rate at which the button press repeats. For more information about auto repeat, see page 21-11.

- In the Common tab, specify the button's spacial properties, name, and visibility.
- In the Connections tab, specify the tags with which the button exchanges data. If variable ramp and limit values are selected in the General tab, assign tags or expressions to the Ramp and Limit connections. Ramp buttons have no Indicator connection. For information about assigning tags, see page 20-34.

For details about the options in the tabs, see Help.

3. When you are finished, click OK.

Setting up numeric displays

Use the numeric display object to show the operator numeric information from the data source. For example, you might use a numeric display to show the current temperature of an oven.

How values are displayed

The numeric display shows the value of the Value connection at the data source. The value shown depends on whether the Value connection value is a floating-point number or an integer. Integer values are displayed as is. Floating-point values are rounded to fit the display. The decimal places option also affects how floating point numbers are displayed.

For example, if the numeric display is set up to show 6 digits, with one decimal place, 1234.56 is rounded to 1234.6. 1234.44 is rounded to 1234.4. The decimal counts as one of the digits.

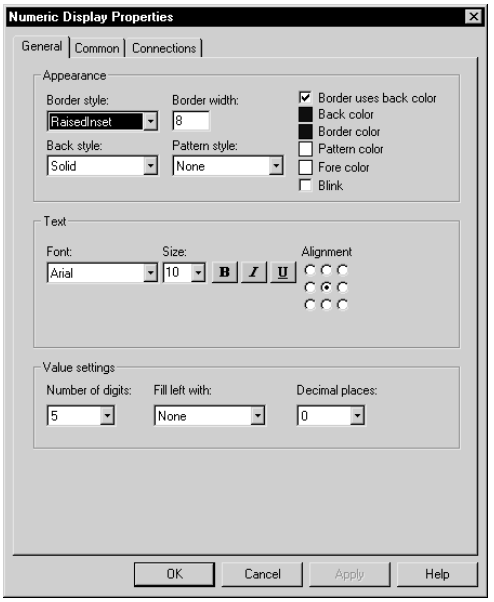
For more information about how values are rounded, see page 7-2.

Problems with displaying values

- If the Value connection is unassigned, the numeric display is filled with asterisks (*).
- If the integer portion of the value, including the decimal point and minus sign, contains more digits than specified for the display, the numeric display is filled with asterisks.
- If the numeric display is sized so that the value cannot be fully displayed, the value is truncated and the last displayable digit is replaced with an asterisk.
- If the value doesn't fit on the first line of the display, and there is room for a second line, the value continues onto the second line.

To set up a numeric display

1. Double-click the numeric display.



2. In the object's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the numeric display looks like at run time.
   - In the Common tab, specify the object's spacial properties, name, and visibility.
   - In the Connections tab, specify the tags or expression whose data is displayed. For information about assigning tags and expressions, see page 20-34.

   For details about the options in the tabs, see Help.
3. When you are finished, click OK.

Setting up numeric input enable buttons

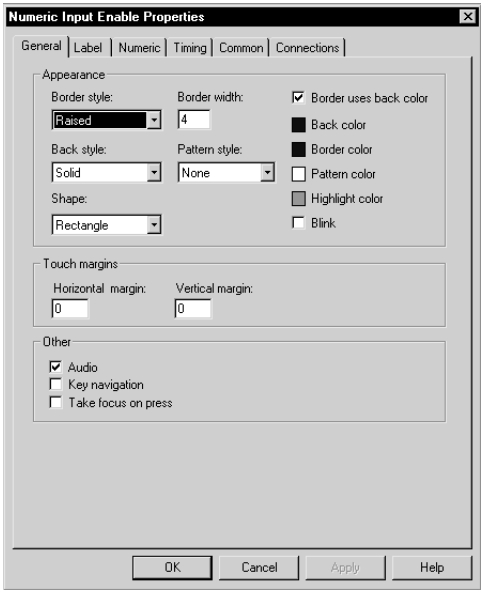
The operator can press the numeric input enable button to open a numeric pop-up keypad or scratchpad, enter a number in the keypad or scratchpad, and then send the number to the data source.

For more information about using the numeric input enable button at run time, see page 17-6.

You can also set up the numeric input enable button to work as a ramp button. In this case, when the button has focus, the operator can press a move up or move down button to change a tag by either an integer or floating-point value. The operator can also press the Up Arrow or Down Arrow on the keyboard or keypad to ramp the value.

To set up a numeric input enable button

1. Double-click the numeric input enable button.



2. In the button's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the button looks like at run time, whether the operator can navigate to the button using the keys on the keyboard or keypad, and whether the operator can press the button to give it focus.

- In the Label tab, specify what text or image to display on the button The same text will appear as a caption on the top of the pop-up that opens when the button is pressed at run time.
- In the Numeric tab, set up which pop-up window opens (if any), the ramp value (if any), minimum and maximum values to send to the data source, whether the minimum and maximum values will be variable (from tags or expressions) or constant, and decimal point settings.
- In the Timing tab, set up the timing and handshake settings for the Enter key. These settings do not apply when you ramp a value. For information about using Enter key handshaking, see page 21-12.
- In the Common tab, specify the button's spacial properties, name, and visibility.
- In the Connections tab, specify the tags or expressions with which the button exchanges data. For information about assigning tags and expressions, see page 20-34.

For details about the options in the tabs, see Help.

3. When you are finished, click OK.

Setting up numeric input cursor points

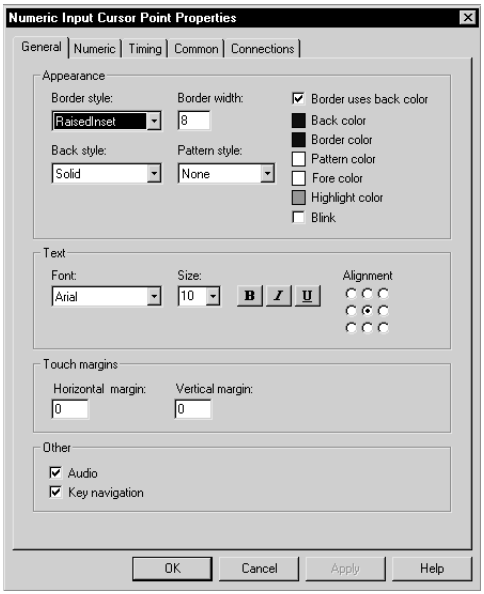
The operator can activate the numeric input cursor point to open a numeric pop-up keypad or scratchpad. The operator can enter a number in the keypad or scratchpad, and then send the number to the data source. The cursor point displays the current value at the data source (if you assign a tag to the Indicator connection).

For more information about using the numeric input cursor point at run time, see page 17-6.

You can also set up the numeric input cursor point to work as a ramp button. In this case, when the cursor point has focus, the operator can press a move up or move down button to change a tag by either an integer or floating-point value. The operator can also press the Up Arrow or Down Arrow on the keyboard or keypad to ramp the value.

To set up a numeric input cursor point

1. Double-click the numeric input cursor point.



2. In the object's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the cursor point looks like at run time, and whether the operator can navigate to the cursor point using the keys on the keyboard or keypad.
   - In the Numeric tab, set up which pop-up window opens (if any), what caption (if any) will be displayed on the pop-up, the ramp value (if any), minimum and maximum values to send to the data source, whether the minimum and maximum values will be variable (from tags or expressions) or constant, decimal point settings, and display settings.
   - In the Timing tab, set up the timing and handshake settings for the Enter key. These settings do not apply when you ramp values. For information about using Enter key handshaking, see page 21-12.
   - In the Common tab, specify the object's spacial properties, name, and visibility.
   - In the Connections tab, specify the tags or expression with which the numeric input cursor point exchanges data. For information about assigning tags and expressions, see page 20-34.

For details about the options in the tabs, see Help.

3. When you are finished, click OK.

Setting up string displays

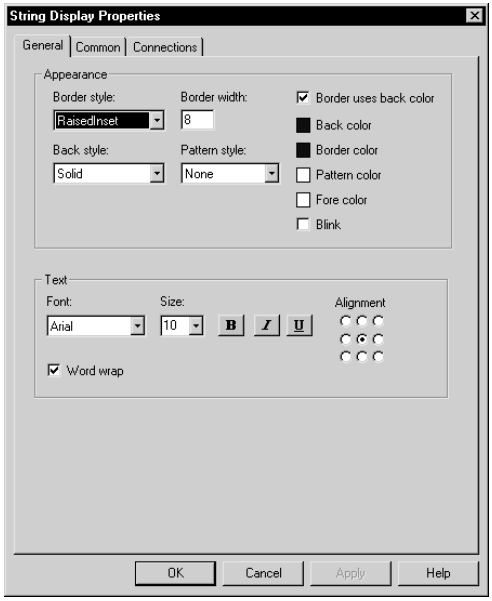
Use the string display object to show the operator messages from the data source. For example, you might set up the data source to generate strings that report on the state of a process or operation, or that provide instructions about what the operator needs to do next. At run time the display shows the operator the string value of the Value connection at the data source.

How values are displayed

- If the Value connection is unassigned, the string display is blank.
- FactoryTalk View displays the number of characters (bytes) specified for the tag assigned to the Value connection.

To set up a string display

1. Double-click the string display.



2. In the object's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the string display looks like at run time.

- In the Common tab, specify the string display's spacial properties, name, and visibility.
- In the Connections tab, specify the tag or expression whose data is displayed. For information about assigning tags and expressions, see page 20-34.

For details about the options in the tabs, see Help.

3. When you are finished, click OK.

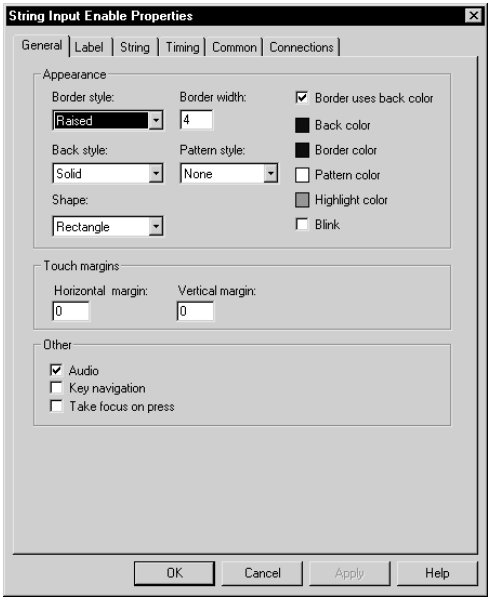
Setting up string input enable buttons

The operator can press the string input enable button to open a string pop-up scratchpad or keyboard. The operator can enter text in the scratchpad or keyboard, and then send the string to the data source.

For more information about using the string input enable button at run time, see page 17-6.

To set up a string input enable button

1. Double-click the string input enable button.



2. In the button's Properties dialog box, fill in the options on each tab:

- In the General tab, specify what the button looks like at run time, whether the operator can navigate to the button using the keys on the keyboard or keypad, and whether the operator can press the button to give it focus.
- In the Label tab, specify what text or image to display on the button.

  The same text will appear as a caption on the pop-up that appears when the button is pressed at run time.
- In the String tab, specify the pop-up to open and the number of characters to accept.
- In the Timing tab, set up the timing and handshake settings for the Enter key. For information about using Enter key handshaking, see page 21-12.
- In the Common tab, specify the button's spacial properties, name, and visibility.
- In the Connections tab, specify the tags or expression with which the button exchanges data. For information about assigning tags and expressions, see page 20-34.

For details about the options in the tabs, see Help.

3. When you are finished, click OK.

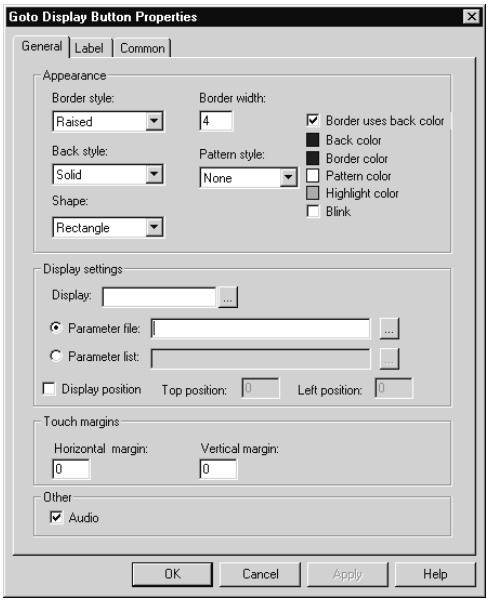
Setting up goto display buttons

Use the goto display button to open a graphic display. You can create as many goto display buttons as you need, but each button opens a single display only.

For more information about using goto display buttons, see page 13-4.

To set up a goto display button

1. Double-click the goto display button.



2. In the button's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the button looks like at run time, the display to open, and the parameter file or parameter list to use, if any.
   - In the Label tab, specify what text or image to display on the button.
   - In the Common tab, specify the button's spacial properties, name, and visibility.

   For details about the options in the tabs, see Help.
3. When you are finished, click OK.

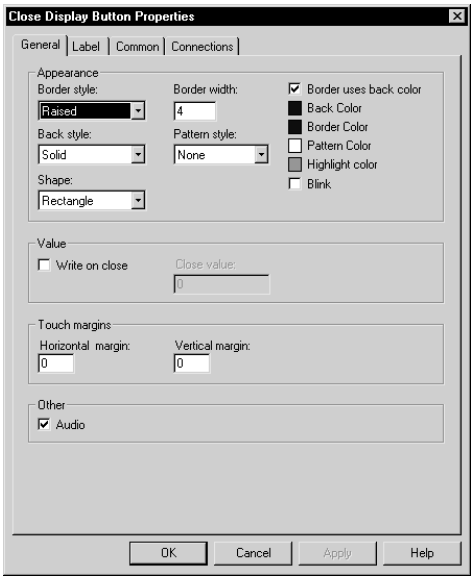
Setting up close display buttons

When the operator presses a close display button at run time, the graphic display that the button is on closes. You can set up the button to write out a value when the display closes.

For more information about using close display buttons, see page 13-6.

To set up a close display button

1. Double-click the button.



2. In the button's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the button looks like at run time, and whether to write out a value when the display closes.
   - In the Label tab, specify what text or image to display on the button.
   - In the Common tab, specify the button's spacial properties, name, and visibility.
   - In the Connections tab, specify the tag with which the button exchanges data. For information about assigning tags, see page 20-34.

   For details about the options in the tabs, see Help.
3. When you are finished, click OK.

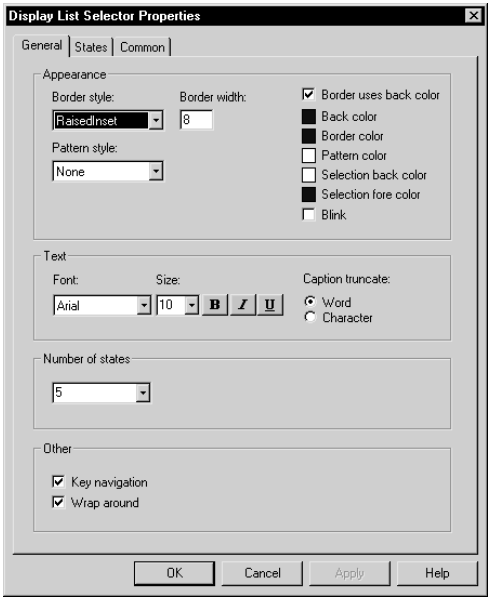
Setting up display list selectors

The display list selector is a list of graphic displays in the application. Each graphic display is represented by a different state in the display list selector. An operator can scroll through the list of displays, and then select the display to open by pressing an enter button or Enter key.

For more information about using display list selectors, see page 13-6.

To set up a display list selector

1. Double-click the display list selector.



2. In the object's Properties dialog box, fill in the options on each tab:

   - In the General tab, specify what the selector looks like at run time, its number of states, whether the operator can navigate to the selector using the keys on the keyboard or keypad, and whether the cursor wraps from the bottom of the list back to the top.
   - In the States tab, specify which graphic display to use for each of the display list selector's states, whether the display will use a parameter file or list when it opens, its opening position, and how each graphic display is named in the list. For tips about setting up states, see page 21-3.
   - In the Common tab, specify the display list selector's spacial properties, name, and visibility.

   For details about the options in the tabs, see Help.

3. When you are finished, click OK.

How to use indicators

Indicators display the status of processes or operations by showing different colors, captions, or images to reflect different states.

You can create different kinds of indicators to suit your needs:

Multistate indicators display the current state of a process or operation by showing a different color, caption, or image to reflect different states.

Symbols display a symbol that changes color to indicate the state of a process or operation. This allows the operator to see the status of a process or operation at a glance.

List indicators display a list of states for a process or operation, and highlight the current state. Each state is represented by a caption in the list. This type of indicator is useful if you want operators to view the current state, but also see the other possible states. For sequential processes, the list can inform the operator about what happens next.

Setting up multistate indicators

The multistate indicator displays the current state of a process or operation by showing a different color, caption, or image for each state.

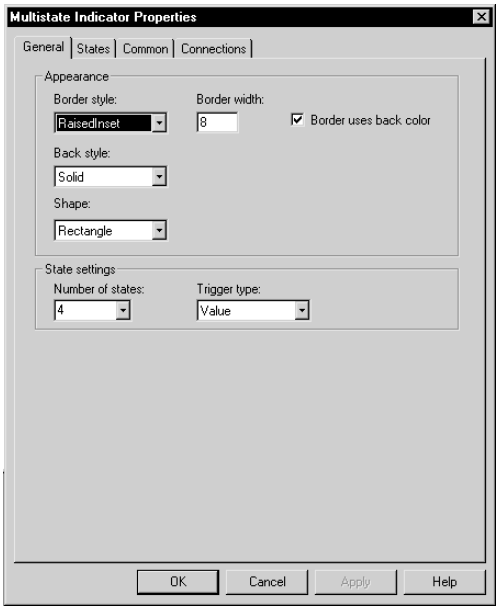
The error state

The multistate indicator's error state is displayed at run time when:

- the Indicator connection is unassigned.
- the Indicator connection's value does not match one of the state values you set up.
- the Trigger type is set to Value and the Indicator connection value does not match one of the state values you set up.
- the Trigger type is set to LSB and the position of the least significant bit set in the Value connection does not match one of the state values you set up.
- the Trigger type is set to Value and an array tag has been assigned to the object's Value connection.

To set up a multistate indicator

1. Double-click the multistate indicator.



2. In the object's Properties dialog box, fill in the options on each tab:

   - In the General tab, specify what the indicator looks like, and the number of states for the indicator.
   - In the States tab, specify how the indicator's appearance changes when its tag or expression's value changes. For tips about setting up states, see page 21-3.
   - In the Common tab, specify the indicator's spacial properties, name, and visibility.
   - In the Connections tab, specify the tag or expression from which the indicator receives data. For information about assigning tags and expressions, see page 20-34.

   For details about the options in the tabs, see Help.

3. When you are finished, click OK.

Setting up symbols

The symbol is an indicator that displays a single monochrome image that changes color to match the state of a process or operation. This allows the operator to see the status of a process or operation at a glance.

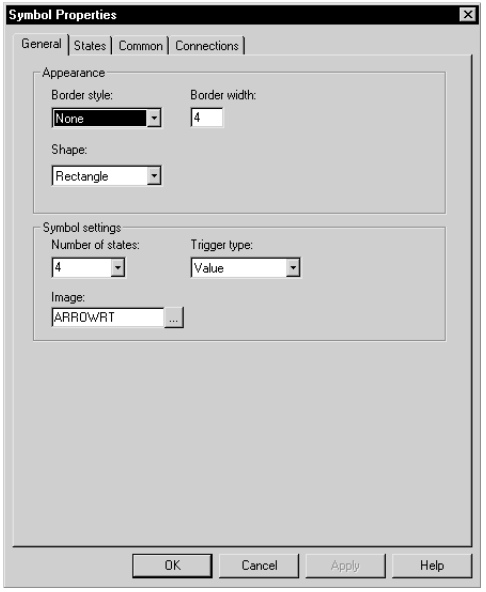
The error state

The symbol's error state is displayed at run time when:

- the Indicator connection is unassigned.
- the Indicator connection's value does not match one of the state values you set up.
- the Trigger type is set to Value and the Indicator connection value does not match one of the state values you set up.
- the Trigger type is set to LSB and the position of the least significant bit set in the Value connection does not match one of the state values you set up.
- the Trigger type is set to Value and an array tag has been assigned to the object's Value connection.

To set up a symbol

1. Double-click the symbol.



2. In the object's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the symbol looks like at run time, and the number of states for the symbol.
   - In the States tab, specify how the symbol's appearance changes when its tag or expression's value changes. For tips about setting up states, see page 21-3.
   - In the Common tab, specify the symbol's spacial properties, name, and visibility.
   - In the Connections tab, specify the tag or expression from which the symbol receives data. For information about assigning tags and expressions, see page 20-34.

   For details about the options in the tabs, see Help.
3. When you are finished, click OK.

Setting up list indicators

The list indicator displays a list of states for a process or operation, and highlights the current state.

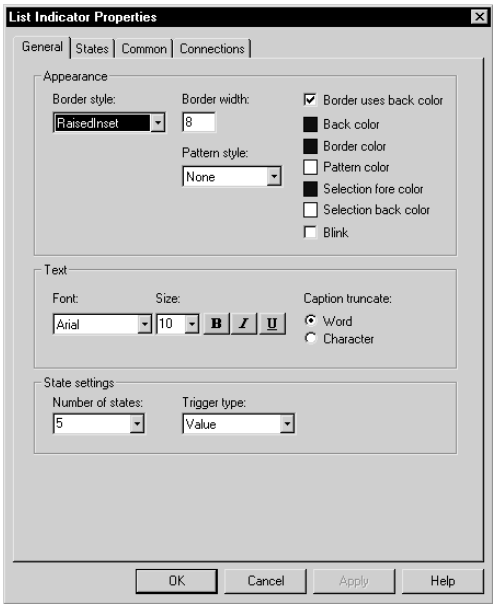
Each state is represented by a caption in the list. This type of indicator is useful if you want operators to view the current state, but also see the other possible states.

For sequential processes, the list can inform the operator about what happens next.

The list indicator has no error state. If the value of the Indicator connection does not match any of the available states, none of the states is highlighted.

To set up a list indicator

1. Double-click the list indicator.



2. In the object's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the indicator looks like at run time, and the number of states for the indicator.
   - In the States tab, specify how the indicator's appearance changes when its tag or expression's value changes. For tips about setting up states, see page 21-3.
   - In the Common tab, specify the indicator's spacial properties, name, and visibility.
   - In the Connections tab, specify the tag or expression from which the indicator receives data. For information about assigning tags and expressions, see page 20-34.

   For details about the options in the tabs, see Help.
3. When you are finished, click OK.

How to use bar graphs, gauges, and scales

Bar graphs and gauges display graphical representations of numeric values. The scale is used with bar graphs to indicate the range of values for the bar graph.

Bar graphs make it easy to compare values

Bar graphs display numeric values in bar graph format. They are useful for allowing comparisons between multiple values, or for representing the fill levels of tanks for which a reading on a vertical scale is appropriate.

For example, one bar graph can show the required level of a tank, and a second bar graph can show the actual level of the tank. The first graph can change to represent the required level for a particular application, and the second graph changes as the actual level in the tank rises or drops.

Bar graphs are more useful than numeric displays when it's important for the operator to analyze the relationships between numeric values. It's easier for the operator to see that one graph is at a lower level than the other, or that one's fill is blue and the other's is yellow, than it is to subtract one numeric value from another.

Thresholds change a bar graph's fill color

As it fills, a bar graph can change its fill color to help an operator recognize abnormal conditions. The change in color happens when the tag (or expression) value crosses a threshold you set up for the graph. For example:

- If the temperature of an oven is lower than required for a recipe, the bar graph can show the temperature in blue.
- If the temperature is in the correct range for the recipe, the bar graph can show the temperature in green.
- If the temperature is higher than the recipe allows, the bar graph can show the temperature in red.

If you want to use a different fill color on a bar graph to show abnormal conditions, make sure enough of the new fill color is visible when the abnormal condition occurs that the operator can see the condition.

Use bar graphs with scales to show limits

Unlike gauges, bar graphs do not have integrated scales. You can show values on a bar graph using a scale graphic object and text.

Scales consist of major ticks, represented by long lines, and minor ticks, represented by short lines. To indicate the values of major or minor ticks, use text objects.

Gauges make it easy to see limits

Gauges display numeric values in dial format. They are useful for displaying a value in relation to its lower and upper limits.

For example, a temperature gauge shows the current temperature in relation to its minimum and maximum extremes. By looking at the position of the needle on the gauge (pointing left, up, or right), the operator can tell at a glance whether the temperature is nearer its lower limit, nearer the middle, or nearer its upper limit.

Gauges are used instead of numeric displays when it's important for the operator to recognize an abnormal condition instantly, either from far away when the scale on the gauge isn't visible, or before the operator has had the opportunity to determine the exact reading on the gauge. This characteristic of gauges is one of the reasons why they are used in automobile instrumentation.

Thresholds change a gauge's fill color

As the needle sweeps higher on a gauge, the gauge can fill the area behind the needle with a color. The gauge can change its fill color to help an operator recognize abnormal conditions. The change in color happens when the tag (or expression) value crosses a threshold you set up for the gauge. For example:

- If the temperature of an oven is lower than required for a recipe, the gauge can show the temperature in blue.
- If the temperature is in the correct range for the recipe, the gauge can show the temperature in green.
- If the temperature is higher than the recipe allows, the gauge can show the temperature in red.

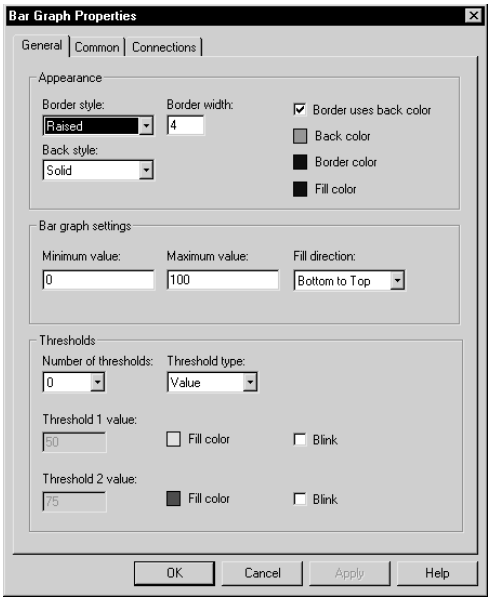
Some people are color blind to red and green, so don't rely on color alone to establish meaning.

Setting up bar graphs

Use bar graphs to represent numeric values by filling and emptying the object as the values rise and fall.

To set up a bar graph

1. Double-click the bar graph.



2. In the object's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the bar graph looks like at run time.
   - In the Common tab, specify the bar graph's spacial properties, name, and visibility.
   - In the Connections tab, specify the tag or expression from which the bar graph receives data. For information about assigning tags and expressions, see page 20-34.

   For details about the options in the tabs, see Help.

3. When you are finished, click OK.

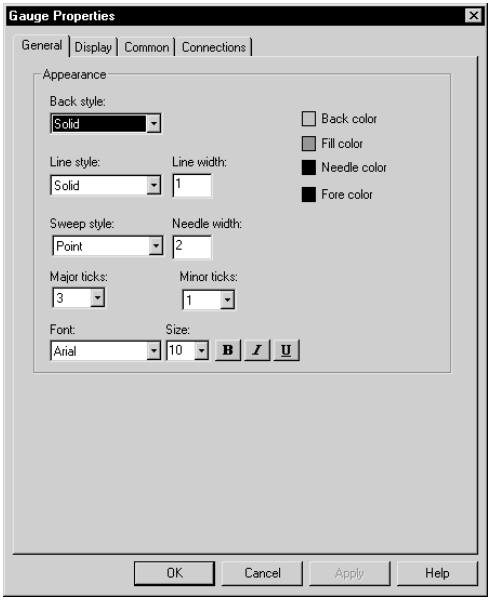
Setting up gauges

The gauge graphic object represents numeric values using a needle on a dial.

At run time, the gauge indicates the value of a tag or expression in relation to the gauge's minimum and maximum values.

To set up a gauge

1. Double-click the gauge.



2. In the object's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the gauge looks like at run time.
   - In the Display tab, specify how the gauge displays values at run time.
   - In the Common tab, specify the gauge's spacial properties, name, and visibility.
   - In the Connections tab, specify the tag or expression from which the gauge receives data. For information about assigning tags and expressions, see page 20-34.

   For details about the options in the tabs, see Help.

3. When you are finished, click OK.

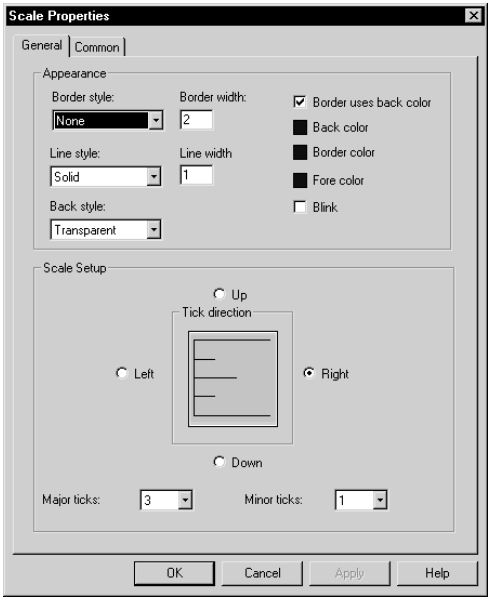
Setting up scales

Use the scale graphic object to show the possible range of values for a bar graph.

To place value labels on the scale (to create a legend), use text objects. Create the text objects and then position them next to the tick marks on the scale. Group all the objects with the bar graph.

To set up a scale

1. Double-click the scale.



2. In the object's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the scale looks like at run time.
   - In the Common tab, specify the scale's spacial properties, name, and visibility.

   For details about the options in the tabs, see Help.
3. When you are finished, click OK.

Setting up control list selectors

Control list selectors allow an operator to scroll through a list of states for a process and select one of the states. A highlight in the list shows the current state.

A control list selector can show several states at the same time, but only one state can be selected at a time. As the operator scrolls through the list, each successive state is selected automatically. If you want the operator to confirm the selection of a particular state before the state's value is written to the programmable controller, create an enter button on the same display as the control list selector, and select the "Write on enter" option.

The operator can scroll through the control list selector using:

- key button graphic objects. These are graphic objects that duplicate the functions of keyboard keys.
- the arrow keys and Enter key on a terminal's keypad.
- the arrow keys and Enter key on a keyboard.

Using buttons with the control list selector

The operator presses the buttons to scroll up or down the list, or to make selections from the list. The buttons can be set up to work with the control list selector that has input focus, or you can link the buttons to a specific control list selector.

Use this button	To do this
Backspace	Move the cursor back to the highlighted item in the list.
End	Move to the bottom item in the list.
Enter	Select the item the cursor is pointing to.
Home	Move to the top item in the list.
Move down	Move down one item in the list.
Move up	Move up one item in the list.
Page down	Move down one page in the list.
Page up	Move up one page in the list.

How Enter key handshaking works

When the operator selects a state in the control list selector and presses an enter button or Enter key, the highlighted state's value is written to the programmable controller or device.

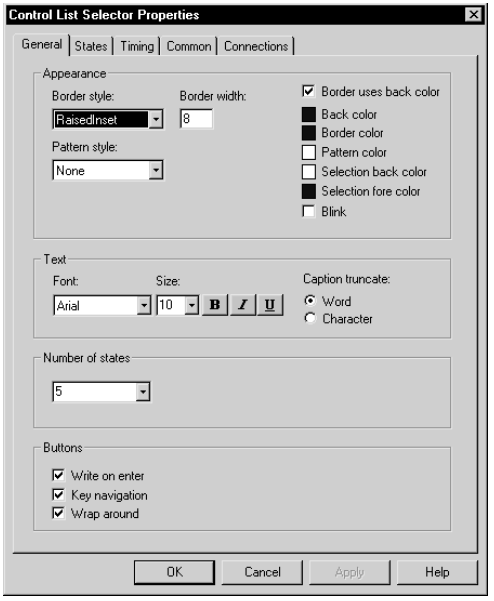
You can use Enter key handshaking to hold the value of the tag at the programmable controller or device for a specific period of time, to ensure the value is read before the control list selector overwrites the value with a new value.

Enter key handshaking only works if the Write on enter check box is selected (in the General tab).

For more information about using Enter key handshaking, see page 21-12.

To set up a control list selector

1. Double-click the control list selector.



2. In the object's Properties dialog box, fill in the options on each tab:

   - In the General tab, specify what the selector looks like at run time, its number of states, whether to write out a value when the operator presses the Enter key, whether the operator can navigate to the selector using the keys on the keyboard or keypad, and whether the cursor wraps from the bottom of the list back to the top.
   - In the States tab, set up the value and caption for each state. The value defines the control list selector's action, by changing the Value connection to the value you specify when the selected state is in effect. For tips about setting up states, see page 21-3.

- In the Timing tab, set up the timing and handshake settings for the Enter key. For information about using Enter key handshaking, see page 21-12.
- In the Common tab, specify the control list selector's spacial properties, name, and visibility.
- In the Connections tab, specify the tags or expression with which the control list selector exchanges data. For information about assigning tags and expressions, see page 20-34.

For details about the options in the tabs, see Help.

3. When you are finished, click OK.

Setting up piloted control list selectors

Piloted control list selectors allow an operator or remote device to scroll through a list of states for a process and select one of the states. A highlight in the list shows the current state.

Choosing between piloted control list selectors and control list selectors

Piloted control list selectors include the following features that control list selectors do not:

- The states can be selected either by an operator, or remotely, for example by a programmable controller, or by both an operator and a remote device. Individual states can be turned off, to prevent them from being selected by either the operator or the remote device.

  Control list selectors do not allow states to be turned off.

- The state values of all of the items that are visible in the list can be written to the Visible States connection when the list scrolls. The Visible States connection must be a data-server tag that supports arrays. You cannot use an HMI tag.

  Control list selectors have no Visible States connection.

- The state value of the item at the top of the list can be written to the Top Position connection when the list scrolls.

  Control list selectors have no Top Position connection.

How piloted control list selectors work at run time

A piloted control list selector can show several states at the same time, but only one state can be selected at a time.

You can set up the piloted control list selector to be operator-controlled or remote-controlled by assigning tags or expressions in the Connections tab.

You can also set up individual states to be operator-controlled, remote-controlled, both, or none. If set to none, the state is turned off.

If the piloted control list selector is set up to be operator-controlled, and the operator selects a remote-controlled state, or one that is turned off, a hollow cursor is displayed.

The operator can select this state.

The operator cannot select this state.

Using buttons with the piloted control list selector

When a piloted control list selector is operator-controlled, it works with:

- key button graphic objects. These are graphic objects that duplicate the functions of keyboard keys.
- the arrow keys and Enter key on a terminal's keypad.
- the arrow keys and Enter key on a keyboard.

The operator presses the buttons to scroll up or down the list, or to make selections from the list. The buttons can be set up to work with the piloted control list selector that has focus, or with a specific piloted control list selector. You can use the buttons listed in the table on page 21-49.

Selecting items in the list

Each state can be selected directly by an operator, or remotely by a device such as a programmable controller. The operator or the controller scrolls through the list to select a different state or a different group of visible states.

When an operator or remote device selects a state, the value assigned to the selected state is written to the piloted control list selector's Value connection. If the state is turned off, the state's value is not written to the Value connection.

If the operator attempts to select a state that is remote-controlled, the state's value is not written to the Value connection.

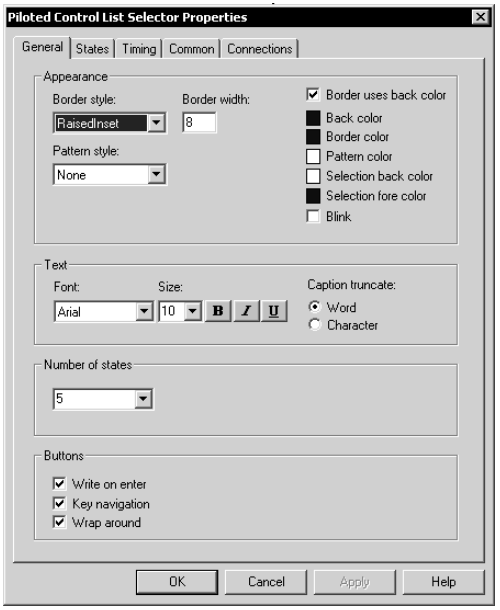
Scrolling through the list

If the piloted control list selector contains more states than can be displayed in the list simultaneously, the value of the Top Position connection (if assigned) changes whenever the item at the top of the list changes.

If the Visible States connection is assigned, the values assigned to all visible states are written to the Visible States connection whenever the list scrolls. To use this feature, the assigned tag must support arrays, and the array must be the same length as the number of visible states in the piloted control list selector. For information about using array tags, see page 9-15.

To set up a piloted control list selector

1. Double-click the piloted control list selector.



2. In the object's Properties dialog box, fill in the options on each tab:

   - In the General tab, specify what the selector looks like at run time, its number of states, whether to write out a value when the operator presses the Enter key, whether the operator can navigate to the selector using the keys on the keyboard or keypad, and whether the cursor wraps from the bottom of the list back to the top.

- In the States tab, set up the value and caption for each state. Also specify whether each state can be selected, and by whom. For tips about setting up states, see page 21-3.
- In the Timing tab, set up the timing and handshake settings for the Enter key. For information about using Enter key handshaking, see page 21-12.
- In the Common tab, specify the piloted control list selector's spacial properties, name, and visibility.
- In the Connections tab, specify the tags or expression with which the piloted control list selector exchanges data. For information about assigning tags and expressions, see page 20-34.

For details about the options in the tabs, see Help.

3. When you are finished, click OK.

Setting up local message displays

Use local message displays to provide the operator with information about what to do next, or with information about a process. At run time, the local message display shows one message at a time.

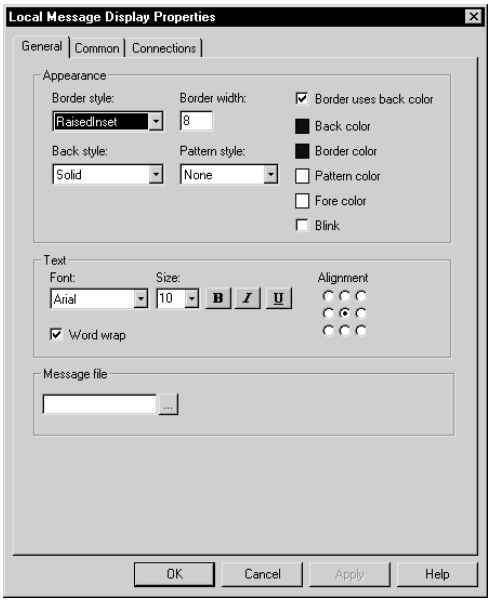
To use local messages, create a local message display object in a graphic display, and then assign a local message file to the local message display object.

For more information about local messages, see page 19-26.

If no message exists for the trigger value that matches the value of the Value connection, the display is filled with question marks (?).

To set up a local message display

1. Double-click the local message display.



2. In the object's Properties dialog box, fill in the options on each tab:

   - In the General tab, specify what the local message display looks like at run time and which local message file to use.
   - In the Common tab, specify the local message display's spacial properties, name, and visibility.
   - In the Connections tab, specify the tag or expression with which the local message display exchanges data. For information about assigning tags and expressions, see page 20-34.

   For details about the options in the tabs, see Help.

3. When you are finished, click OK.

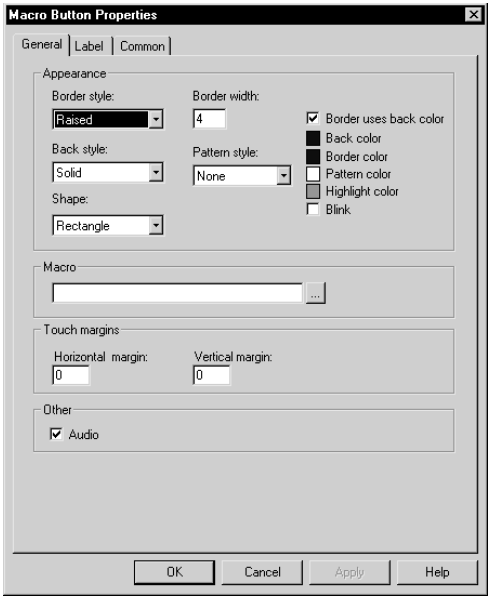
Setting up macro buttons

Macro buttons run macro files that assign values to tags when the button is pressed.

For information about creating macros, see Chapter 30.

To set up a macro button

1. Double-click the button.



2. In the button's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the button looks like at run time, and the macro to run when the button is pressed.
   - In the Label tab, specify what text or image to display on the button.
   - In the Common tab, specify the button's spacial properties, name, and visibility.

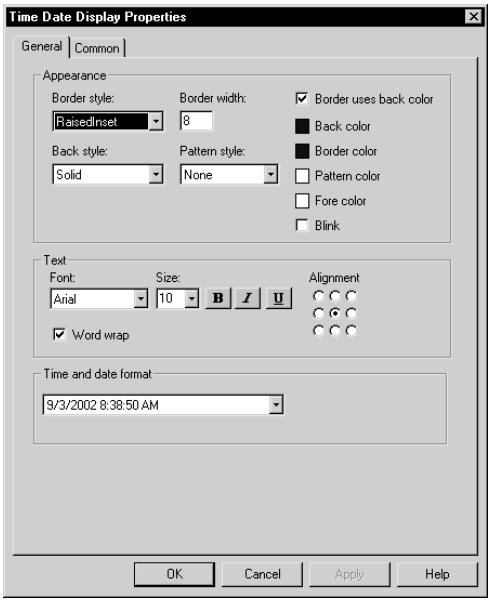
   For details about the options in the tabs, see Help.
3. When you are finished, click OK.

Setting up time and date displays

A time and date display shows the current time and date in a graphic display.

To set up a time and date display

1. Double-click the time and date display.



2. In the object's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the time and date display looks like at run time.
   - In the Common tab, specify the time and date display's spacial properties, name, and visibility.

   For details about the options in the tabs, see Help.
3. When you are finished, click OK.

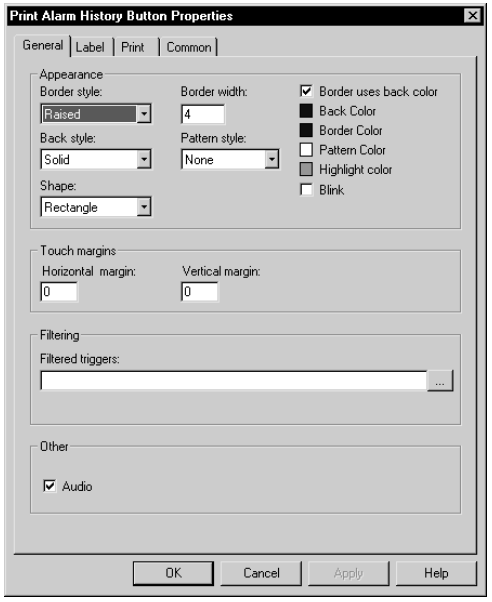
Setting up print alarm history buttons

The operator can press the print alarm history button to print a report of all the alarm messages in the alarm log file. The report can include the time alarms occurred and were acknowledged.

For information about the alarm log file, see page 9-10.

To set up a print alarm history button

1. Double-click the button.



2. In the button's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the button looks like at run time and whether to filter the alarms to include in the report.
   - In the Label tab, specify what text or image to display on the button.
   - In the Print tab, specify what information to print on the report.
   - In the Common tab, specify the button's spacial properties, name, and visibility.

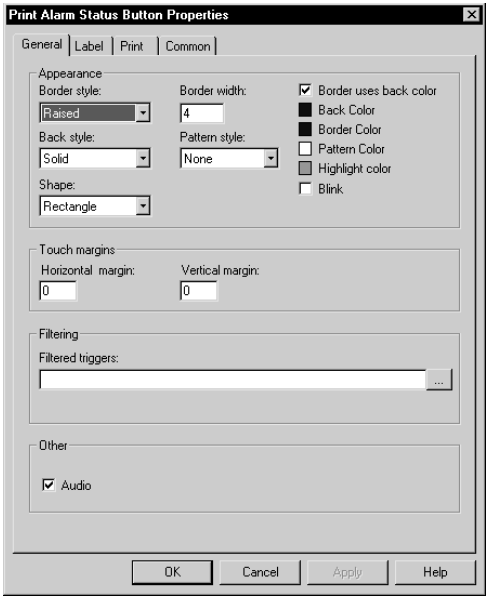
   For details about the options in the tabs, see Help.
3. When you are finished, click OK.

Setting up print alarm status buttons

The operator can press the print alarm status button to print a report of the status of alarms that have been defined for the application (in the Alarm Setup editor). The report can include all alarms, active alarms only, or only alarms that have been active since the alarm status was last reset. The report can include how many times each alarm was triggered, and the accumulated time in alarm.

To set up a print alarm status button

1. Double-click the button.



2. In the button's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the button looks like at run time and whether to filter the alarms to include in the report.
   - In the Label tab, specify what text or image to display on the button.
   - In the Print tab, specify what information to print on the report.
   - In the Common tab, specify the button's spacial properties, name, and visibility.

   For details about the options in the tabs, see Help.
3. When you are finished, click OK.

Setting up alarm lists

The alarm list graphic object displays a list of alarms from the alarm log file. It can show all the alarms in the alarm log file, or any combination of active, inactive, acknowledged, and unacknowledged alarms. It can also show the alarms for specific alarm triggers.

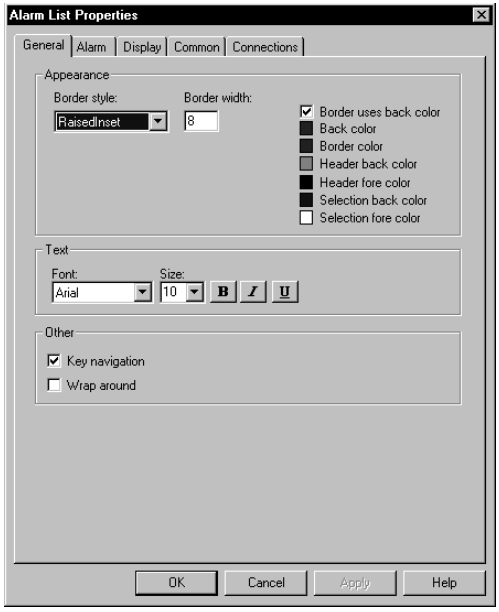
You can assign a tag or expression to the ActiveAcknowledged, ActiveUnacknowledged, InactiveAcknowledged, or InactiveUnacknowledged connections, to allow the data source to control the type of alarms to display in the list. When one of the connection's values is a non-zero value, the related type of alarm is displayed in the alarm list. The connection value overrides the setting for the list in the Alarm List Properties dialog box.

FactoryTalk View comes with two graphic displays, [ALARM MULTI-LINE] and [HISTORY], that contain alarm list objects. The [HISTORY] display comes in two sizes. These displays are in the graphic library. You can copy the library displays into your application and use the displays and objects as is, customize them, or create your own.

For more information about using alarm lists, see page 9-32. For information about the alarm log file, see page 9-10.

To set up an alarm list

1. Double-click the alarm list.



2. In the object's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the alarm list looks like at run time, whether the operator can navigate to the list using a keyboard, and how scrolling works for the list.
   - In the Alarm tab, specify the columns to include in the list, the number of lines per alarm, and the triggers to filter by, if any.
   - In the Display tab, specify the types of alarms to display in the list, and the appearance of the different alarm conditions.
   - In the Common tab, specify the alarm list's spacial properties, name, and visibility.
   - In the Connections tab, specify the tags or expressions to use to control the type of alarms to display in the list. The use of these connections is optional.

   For details about the options in the tabs, see Help.
3. When you are finished, click OK.

Setting up alarm banners

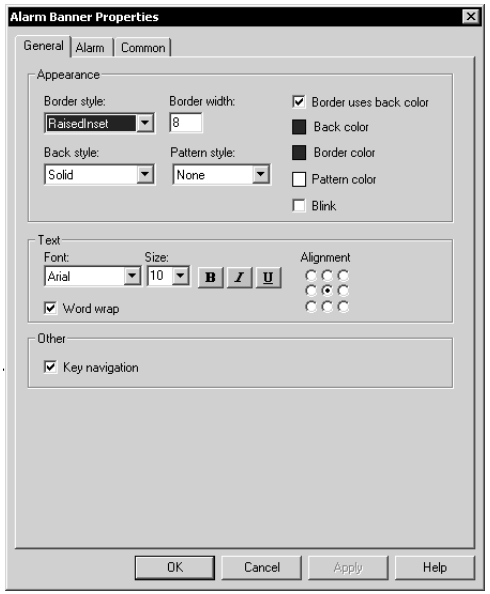
The alarm banner graphic object displays a single unacknowledged alarm message. For example, the banner could display a message that warns the operator that the pressure in a boiler is too high.

The [ALARM] display and the [ALARM BANNER] graphic library both contain an alarm banner object. You can use the displays and objects as is, customize them, or create your own.

For more information about using alarm banners, see page 9-33.

To set up an alarm banner

1. Double-click the alarm banner.



2. In the object's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the banner looks like at run time and whether the operator can navigate to the banner using the keys on the keyboard or keypad.
   - In the Alarm tab, set up whether to queue alarms, whether to display all alarms or active alarms only, and which alarms to include in a filtered trigger list.
   - In the Common tab, specify the alarm banner's spacial properties, name, and visibility.

   For details about the options in the tabs, see Help.
3. When you are finished, click OK.

Setting up alarm status lists

The alarm status list graphic object displays the status of alarms, including how many times an alarm has been triggered and how long it has been active. For example, the list could display an alarm that has been triggered 5 times for a total accumulated time in alarm of 10 minutes.

The operator can view the status list in three different modes:

- All alarms—displays the status of all alarms that have been defined in the Alarm Setup editor.
- Active alarms—displays the status of all the alarms that are currently active.
- Past alarms—displays the status of all the alarms that have been active since the alarm status has been reset.

The operator can press the alarm status mode button to cycle through the different modes.

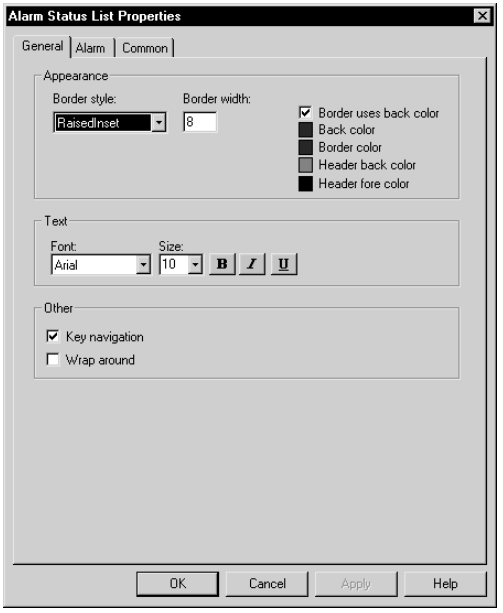
If desired, you can set up the alarm status list to show alarms for specific alarm triggers only.

FactoryTalk View comes with a library graphic display called [STATUS] that contains an alarm status list object, alarm status mode button, and other buttons for working with the list. You can use the display and objects as is, customize them, or create your own.

For more information about using alarm status lists, see page 9-34.

To set up an alarm status list

1. Double-click the alarm status list.



2. In the object's Properties dialog box, fill in the options on each tab:

   - In the General tab, specify what the alarm status list looks like at run time, whether the operator can navigate to the list using a keyboard, and how scrolling works for the list.
   - In the Alarm tab, specify the columns to include in the list, the number of lines per alarm, and the triggers to filter by, if any.
   - In the Common tab, specify the alarm status list's spacial properties, name, and visibility.

   For details about the options in the tabs, see Help.

3. When you are finished, click OK.

Setting up diagnostics lists

The diagnostics list graphic object displays run-time information about system activity:

- Information messages, such as messages about tag assignments, tag read and write activity, and macro usage.

  These are system-generated information messages. They are not the same messages as the information messages you create and display in the information message display object.

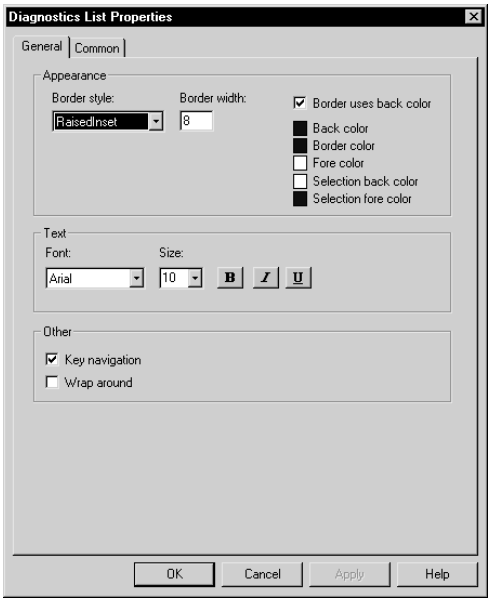
- Warning messages.
- Error messages, such as messages about communication errors, invalid values, and unassigned connections.
- Audit messages about tag writes and tag write failures.

FactoryTalk View comes with a default graphic display called [DIAGNOSTICS] that contains a diagnostics list object. You can use the display and object as is, customize them, or create your own.

For more information about using diagnostics lists, see page 10-12.

To set up a diagnostics list

1. Double-click the diagnostics list.



2. In the object's Properties dialog box, fill in the options on each tab:

   - In the General tab, specify what the list looks like at run time, whether the operator can navigate to the list using the keys on the keyboard or keypad, and whether the cursor wraps from the bottom of the list back to the top.
   - In the Common tab, specify the diagnostics list's spatial properties, name, and visibility.

   For details about the options in the tabs, see Help.

3. When you are finished, click OK.

Setting up information message displays

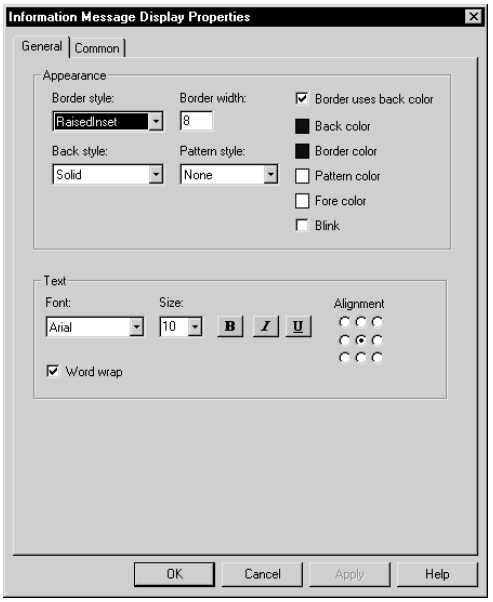
The information message display graphic object gives the operator run-time messages about information that requires immediate attention.

FactoryTalk View comes with a default graphic display called [INFORMATION] that contains an information message display object. You can use the display and object as is, customize them, or create your own.

For more information about using information message displays, see page 27-7.

To set up an information message display

1. Double-click the information message display.



2. In the object's Properties dialog box, fill in the options on each tab:
   - In the General tab, specify what the information message display looks like at run time.
   - In the Common tab, specify the information message display's spacial properties, name, and visibility.

   For details about the options in the tabs, see Help.
3. When you are finished, click OK.

22 Animating graphic objects

This chapter describes:

- the types of animation and which objects support which types of animation.
- using the Animation dialog box.
- testing animation.
- using tag names, tag placeholders, and expressions when attaching animation.
- setting the minimum and maximum values for animation that uses a range of motion.
- using Object Smart Path to define an object's range of motion.
- setting up each type of animation.
- applying animation to groups.
- checking what kind of animation is attached to an object.
- copying and pasting animation.
- setting up animation for global objects.

Types of animation

Animation associates graphic objects with tags so the appearance or position of an object changes to reflect changes to the tag's value. For example, an object's color could change from yellow to orange to red as the tag's value increases. Or a slider could move from left to right as a tag's value increases.

You can use these types of animation:

- color
- fill
- height
- horizontal position
- horizontal slider
- rotation
- vertical position
- vertical slider
- visibility

- width

The Objects 5 Screen Demo sample application contains many examples of animation. In particular, see the graphic displays called "Animation I" and "Animation II."

Which objects can have which types of animation?

This table summarizes which types of objects support which types of animation. For information about the different types of graphic objects, see page 20-1.

These objects	Support these types of animation
Drawing objects, except images, panels, and rounded rectangles	All types
Rounded rectangles	All types except rotation
All other objects	Visibility

You can also attach animation to groups of drawing objects. For more information, see page 22-16.

You can attach as many types of animation to a drawing object (except images and panels) as you like. For example, apply width, height, horizontal position, and vertical position animation to an object to give it the appearance of moving into or out of the display as it shrinks and grows.

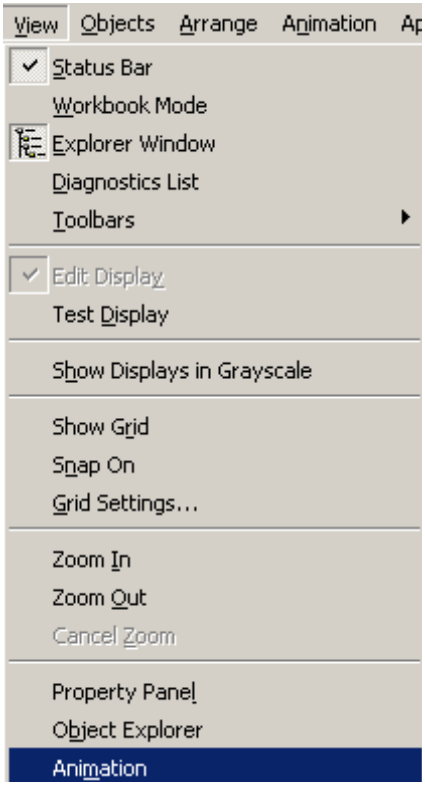
Using the Animation dialog box

To attach animation, use the Animation dialog box.

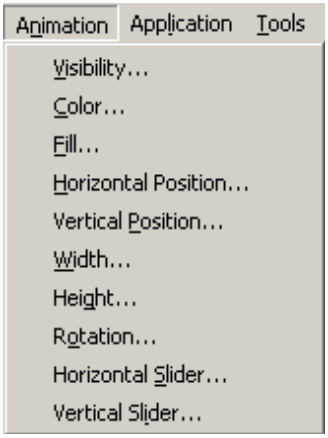
To open the Animation dialog box, do one of the following

- Select an object, and then on the View menu click Animation.
- Select an object, and then on the Animation menu click an animation type. Animation types that are not supported for the selected object are unavailable.
- Right-click an object, select Animation, and then click an animation type. Animation types that are not supported for the selected object are unavailable.

View menu

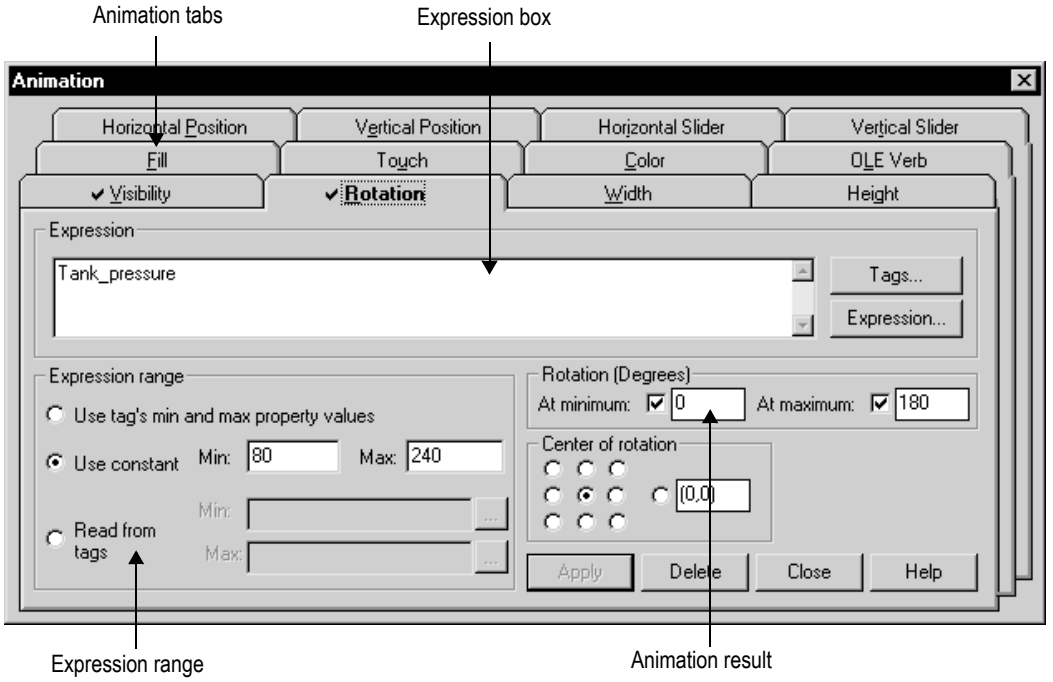


Animation menu



About the Animation dialog box

The Animation dialog box is a floating dialog box, which means you can keep it open all the time and move it around the screen. While it's open you can select other objects and open other dialog boxes.



For details about the parts of the Animation dialog box, see Help.

Using Object Smart Path to visually set animation

Because the Animation dialog box stays open, you can go back and forth between the dialog box and the graphic display. This makes it easy to set the range of motion for an object because you do not have to know how many pixels you want an object to move. Instead, you can set the range of motion visually using the Object Smart Path feature. For details, see page 22-7.

Testing animation

Test Display tool

To test the animation you have set up in a graphic display, use the Test Display tool to switch to test mode. When you are finished testing, switch back to edit mode to continue editing.

Edit Display tool

To switch between test and edit modes

- On the View menu, click Test Display or Edit Display, or click the Test Display and Edit Display tools.

Test mode is not the same as running the display. Test mode does not change the appearance or position of the display as set up in the Display Settings dialog box.

Using tag names and tag placeholders

When setting up animation for objects, you are linking objects to tags. You can specify a tag name or use tag placeholder.

You can use HMI tags or data server tags that already exist, or you can use a new tag name.

Tag placeholders allow you to create displays that can be used with different tags.

You can use tag placeholders in:

- the graphic display that opens when the application is first run.
- graphic displays that are opened using a goto display button.
- graphic displays that are opened using a display list selector.
- the graphic display that opens when the logout button is pressed.
- the graphic display that opens when auto logout is used.
- graphic displays that are opened using the Remote Display Number global connection.

Use parameter files or parameter lists to specify which tags or folders to substitute for which placeholders. For global objects, you can specify the tags or folders of tags using global object parameters. For more information about using parameter files, parameter lists, and global object parameters, see Chapter 25.

The tag placeholder can replace any part of a tag name, including folder names. For example, you could create a parameter file specifying that the tag placeholder #1=Folder1. You could assign the folder and a tag name to a graphic object's connection: #1\Tag1.

To create a tag placeholder

- In the Expression box, type the cross-hatch character followed by a number (no space in between). For example, #1.

Using expressions

Many types of animation can be achieved using expressions. You can use expressions containing tag values, constants, mathematical equations, security functions, and if-then-else logic. A tag name or tag placeholder can be included as part of an expression, or it can stand alone as the entire expression.

For more information about expressions, see Chapter 23.

Setting minimum and maximum values

Many types of animation require a minimum and maximum range for the tag or expression. These values determine the start and end points for a range of motion.

For example, if you specify a minimum of 0 and a maximum of 100, the object will not react to values outside of this range. So, even if the expression has a value of 200, the object does not change from its "At maximum" position.

When setting up animation, select one of these methods for calculating the minimum and maximum values:

- Use tag's min and max property values—select this method to use the minimum and maximum values of the first HMI tag in the expression. If more than one HMI tag is used in the expression, the first HMI tag's minimum and maximum values are used.

  For analog HMI tags, the values are taken from the Minimum and Maximum boxes in the Tags editor. For digital tags, the minimum is 0 and the maximum is 1.

Browse button

- Use constant—select this method to use numeric constants. Type the minimum and maximum values in the boxes.
- Read from tags—select this method to read two tags' values to determine the minimum and maximum values. Type the tag names in the boxes, or click the Browse buttons to open the Tag Browser and select the tags.

  If you use this method, the tags are read when the graphic display opens. Their values at that time are used for the minimum and maximum values. The tags are not read again after this.

Defining a range of motion

To define a range of motion for an object, do one of the following:

- Use the mouse to move the object in the display. This uses the Object Smart Path feature to visually define the range of motion.
- Type values in the At minimum and At maximum boxes.

Motion can be defined in pixels, percentages, or degrees.

Animation that does not use a range of motion

Visibility and color animation do not use a range of motion, because these types of animation represent a change of state, not a range of values.

Using Object Smart Path

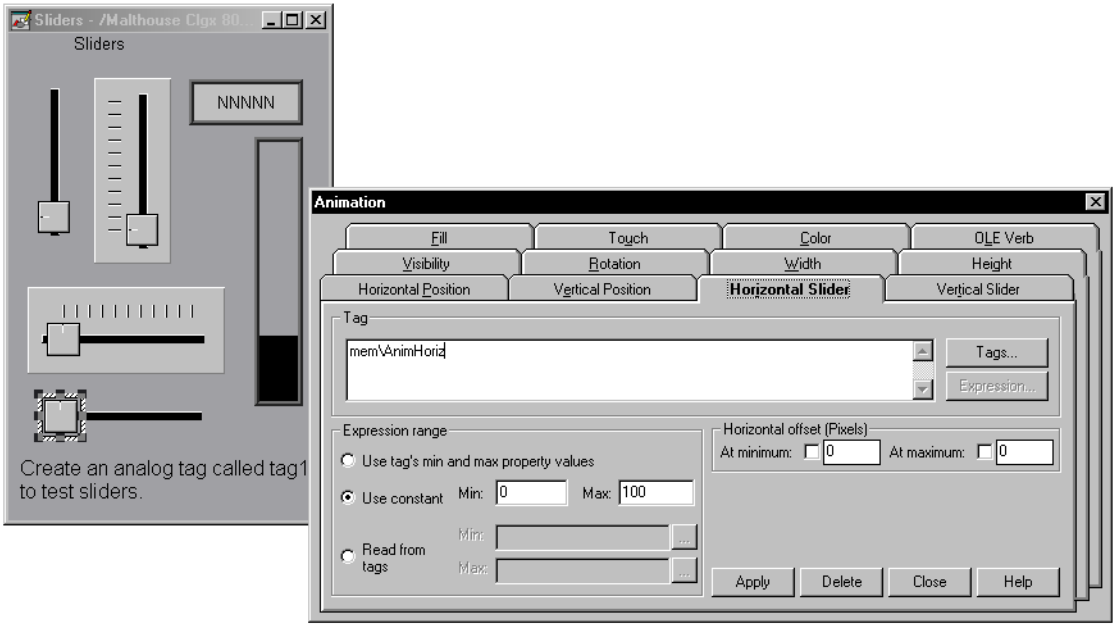
With Object Smart Path, you can easily set the range of motion for an object. The following example shows how Object Smart Path works.

Example: Using Object Smart Path to define the range of motion for horizontal slider animation

To define a range of motion for a slider object

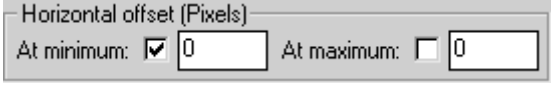
1. In the Graphics editor, create a slider object using a line and a rectangle, or copy a slider object from the Sliders graphic library.
2. Open the Animation dialog box and click the Horizontal Slider tab.
3. In the display, select the rectangle in the slider object.

4. In the Tag box of the Animation dialog box, specify a tag name.

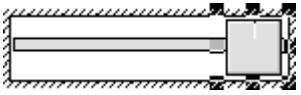


5. In the display, drag the rectangle to the position that will indicate the lowest number in the range.

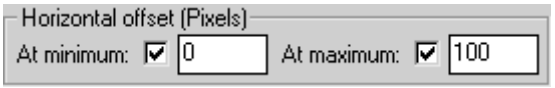
6. In the Animation dialog box, set this position by clicking the At minimum check box.



7. In the display, drag the rectangle to the position that will indicate the highest number in the range.



8. In the Animation dialog box, set this position by clicking the At maximum check box.



9. To save the settings, click Apply.

When you finish setting up the animation, the rectangle returns to its original position.

Setting up the different types of animation

This section describes the different types of animation and provides tips and examples for setting up animation.

Setting up visibility animation

With visibility animation, an object becomes visible or invisible based on a tag value or the result of an expression.

If an object is invisible, it is inactive.

Visibility animation is available for all objects. Visibility animation overrides an object's Visible property.

If you use a tag's value to control visibility animation as well as in an expression to control some other aspect of animation, when you set up visibility, set the Expression true state to "Invisible." If you do not do this, the object could appear briefly in its design-time location and orientation before animating properly.

For more information about setting up visibility animation, see Help.

Example: Using visibility animation to set up security for a graphic display

This example shows how to use visibility animation to control what operators can see. In a graphic display that all users have access to, only the Admin user can see the graphic object to which this animation is attached.

This example uses the security function CurrentUserName( ). The function returns the string value of the Account ID (user name) for the user who is currently logged in.

The CurrentUserName( ) function is case sensitive. All user names use uppercase letters, so make sure that you use uppercase letters in your expression.

To specify which user can view an object in a display

1. Select the object to limit visibility to.
2. Open the Animation dialog box and click the Visibility tab.
3. In the Expression box, type this:

   CurrentUserName( ) == "ADMIN"
4. For the Expression true state, click Visible.
5. Click Apply, and then click Close.

At run time, the object is visible only if the Admin user is logged in.

Setting up color animation

With color animation, an object changes color based on a tag value or the result of an expression. You can specify up to 16 color changes (A to P) for any object. Colors can be solid or blinking. For each color change, specify the value or threshold at which the color is to change and specify the colors to change to. At run time, when the value reaches or crosses the threshold, the color changes.

Choosing between Solid, Original, and Shaded Fill Styles allows for more animation options for the blinking object.

Solid - Allows you to change the colors, and they will have a solid look to them

Original - Retains the colors and the shading of the object as it was imported. Both the line and fill color can be altered from the original using Blink.

Shaded - Uses a tight dot pattern to soften or give a shaded appearance

Some types of graphics are made up of many elements. An individual element can be selected and have color animation applied just to it.

Color animation is available for all drawing objects except images and panels.

KEEP ORIGINAL COLOR

Using the Original Fill Style allows for more variations on animating an object. Instead of a specific color for the object's non-blink state, the object's original color can be used.

If Original is used as a Fill Style on any state, the color palette boxes will not allow a color change. By selecting the Blink option, a different color can be used for both the Line and the Fill color or individually.

Controlling Color Shading

Using the Shaded Fill Style along with the Blink option allows control of the shading aspect of a display object by changing combinations of Line and Fill and different colors.

For more information about setting up color animation, see Help.

Example 1: Creating a text object that blinks

This example describes how to create a text object that constantly blinks between two colors. Since the blinking is not based on changes in tag values, the expression is simply a constant value that matches the value for the selected threshold.

For details about creating text, see page 20-12.

1. Select the text object.
2. Open the Animation dialog box, and then click the Color tab.
3. In the Expression box, type 0.

   Zero is the default value for threshold A.
4. In the list box, click threshold A. (Leave the value in the Value box as 0.)
5. For the line color, click Blink. (If desired, click Blink for the fill color too.)
6. For each color, click the color box, and then click the color to use.
7. Click Apply.

Example 2: Creating an object that changes color as the fill level changes

This example describes how to create a rectangle object that changes color as the object's fill level increases. This example uses a tag called Hopper1\FlourLevel. The tag has a range of 1 to 100. When the flour level reaches 80, the rectangle blinks between gray and yellow to warn the operator that the hopper is nearly full. When the flour level reaches 95, the rectangle blinks between gray and red.

You could use a bar graph object (without animation) to achieve a similar result.

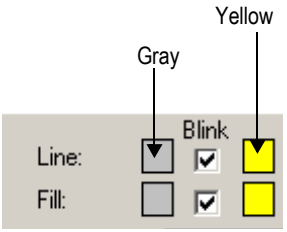
1. Double-click the rectangle to open the Polygon Properties dialog box. Assign these properties to the rectangle:
   - In the Back style box, select Solid.

- For the Fore color and Back color, select gray.

2. Click OK to close the Polygon Properties dialog box.
3. With the rectangle selected, open the Animation dialog box, and then click the Fill tab.
4. Attach fill animation as follows:
   - In the Expression box, type Hopper1\FlourLevel (this is the tag that monitors the fill level).
   - For Fill Direction, click Up.
5. Click the Color tab, and then attach color animation as follows:
   - In the Expression box, type Hopper1\FlourLevel (the same tag that was used in the Fill tab).

   Set up the color for the normal state
   - In the list box, click A. (In the Value box, leave the value as 0.)
   - For Fill Style, click Solid.
   - For Line and Fill, click the color box, and then click gray (the same gray used for the rectangle).

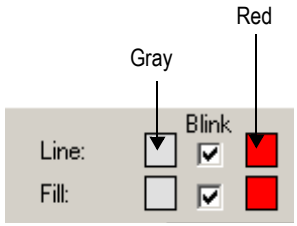
   Set up the color for the first warning
   - In the list box, click B.
   - In the Value box, type 80.
   - For Line and Fill colors, click Blink. A palette box will be displayed for the Blink color.



   - For the line colors, select gray for the first color and yellow for the blink color. Repeat for the fill colors.

   Set up the color for the second warning
   - In the list box, click C.

- In the Value box, type 95.
- For the line and fill, click Blink. A palette box will be displayed for the Blink color.



- For the line colors, select gray for the first color and red for the blink color. Repeat for the fill colors.

6. Click Apply.

Setting up fill animation

With fill animation, the level of fill in an object is based on a tag value (or the result of an expression) in relation to the specified minimum and maximum values. For example, if the value of the expression is halfway between the minimum and maximum values, the object will be half full.

Fill animation is available for all drawing objects (including group objects) except images and panels.

If you select the Inside Only check box, fill animation does not affect objects' borders, line objects, or objects with transparent backgrounds.

For more information about setting up fill animation, see Help.

Setting up horizontal position animation

With horizontal position animation, an object moves horizontally based on a tag value (or the result of an expression) in relation to the specified minimum and maximum values. For example, if the value of the expression is halfway between the minimum and maximum values, the object will be halfway between its minimum and maximum pixel offset.

Horizontal position animation is available for all drawing objects except images and panels.

For more information about setting up horizontal position animation, see Help.

Setting up vertical position animation

With vertical position animation, an object moves vertically based on a tag value (or the result of an expression) in relation to the specified minimum and maximum values. For example, if the value of the expression is halfway between the minimum and maximum values, the object will be halfway between its minimum and maximum offset.

- To move an object on the display "up", a negative offset number is required. The top-left corner of the display has the coordinates of 0,0.

Vertical position animation is available for all drawing objects except images and panels.

For more information about setting up vertical position animation, see Help.

Setting up width animation

With width animation, an object's width changes based on a tag value (or the result of an expression) in relation to the specified minimum and maximum values. For example, if the value of the expression is halfway between the minimum and maximum values, the object's width will be halfway between its minimum and maximum percentage.

Width animation is available for all drawing objects except images and panels.

For more information about setting up width animation, see Help.

Setting up height animation

With height animation, an object's height changes based on a tag value (or the result of an expression) in relation to the specified minimum and maximum values. For example, if the value of the expression is halfway between the minimum and maximum values, the object's height will be halfway between its minimum and maximum percentage.

Height animation is available for all drawing objects except images and panels.

For more information about setting up height animation, see Help.

Setting up rotation animation

With rotation animation, an object rotates around an anchor point based on a tag value (or the result of an expression) in relation to the specified minimum and maximum values. For example, if the value of the expression is halfway between the minimum and maximum values, the object will rotate half the specified amount.

Rotation animation is available for all drawing objects except images, panels, and rounded rectangles. If you apply rotation animation to text, the text rotates around the anchor point but remains in the upright position.

For more information about setting up rotation animation, see Help.

Setting up horizontal slider animation

With horizontal slider animation, you can use a drawing object to set the value of a tag. To do this, define a path for the object. At run time, when the operator moves the object horizontally (using a mouse), the pixel position of the object is translated into values that are written to the tag. If the tag value is changed externally, the position of the slider changes as well.

An object can have both vertical and horizontal slider animation.

Horizontal slider animation is available for all drawing objects except images and panels.

For more information about setting up horizontal slider animation, see Help.

Tips

Here are some tips for creating slider objects:

- The Sliders graphic library contains several slider objects you can drag and drop into your graphic displays. Attach slider animation to the button portion of the slider object.
- If you create your own slider object, it's useful to draw an object (for example, a line) to represent the path the slider will move along.

Setting up vertical slider animation

With vertical slider animation, you can use a drawing object to set the value of a tag. To do this, define a path for the object. At run time, when the operator moves the object vertically (using a mouse), the pixel position of the object is translated into values that are written to the tag. If the tag value is changed externally, the position of the slider changes as well.

An object can have both vertical and horizontal slider animation.

- To move an object on the display "up", a negative offset number is required. The top-left corner of the display has the coordinates of 0,0.

Vertical slider animation is available for all drawing objects except images and panels.

For tips about creating slider objects, see the previous section.

For more information about setting up vertical slider animation, see Help.

Applying animation to groups

You can apply animation to objects and then group those objects and apply animation to the group. When the display is running, animation is applied as follows:

These types of animation	Are applied like this
Color	Animation attached to individual objects within the group overrides group animation.
Fill	Animation results for both the individual objects and the group are applied.
Horizontal slider, vertical slider	Group animation overrides animation attached to individual objects within the group.
Height, width, horizontal position, vertical position, and rotation	Animation results for individual objects and the group are combined. For example, if an individual's horizontal position animation result is to offset the object by 100 pixels, and the group's result is to offset the group by 200 pixels, the individual object is offset by 300 pixels.
Visibility	When the group's animation visibility is False (the group is not visible), then no objects in the group are visible, regardless of the animation status of the individual objects. When the group's animation visibility is True (the group is visible), the visibility of an object within the group is determined by the individual object animation.

Test your animation to ensure you achieve the intended results.

To apply animation to objects within groups, use the group edit feature. For details, see page 20-46.

Checking the animation on objects

To see what type of animation has been set up for an object or group of objects, use the Object Explorer, the Animation menu, or the Animation dialog box.

For information about using the Object Explorer to highlight objects that have animation attached, see page 20-25.

To see what type of animation has been set up for objects within a group, use the group edit feature or the Object Explorer. For information about using the group edit feature, see page 20-46.

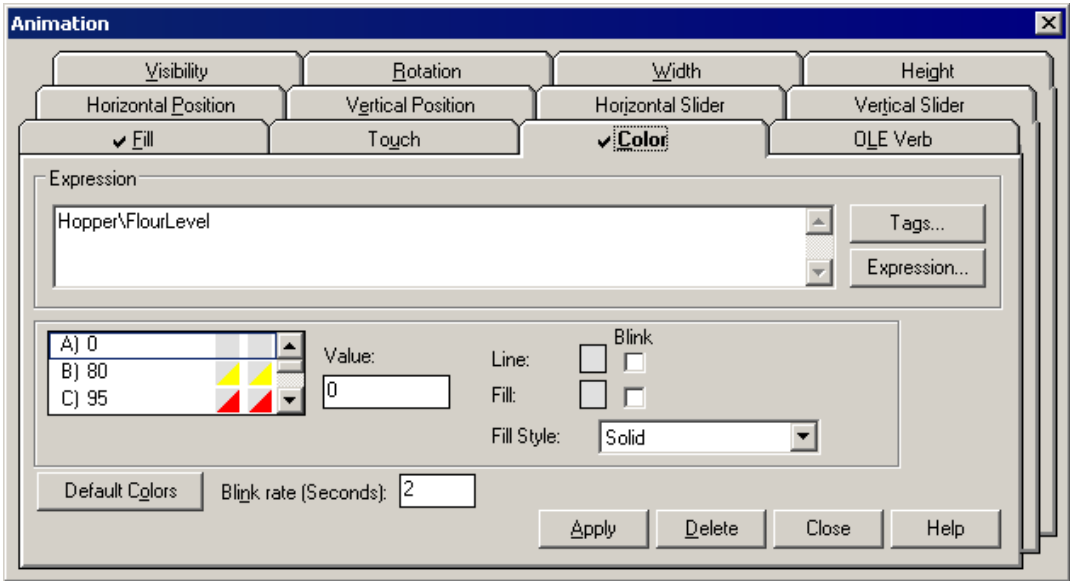
To view the animation on an object using the Animation menu

1. Select an object.
2. View the animation by doing one of the following:
   - Click the Animation menu and see which items have a check mark.
   - Right-click the object and then select Animation to see which items have a check mark.

To view the animation on an object using the Animation dialog box

1. Select an object.
2. On the View menu, click Animation.

   When the Animation dialog box opens, look at which tabs have check marks on them to see which types of animation have been set up.



Copying or duplicating objects with animation

You can copy or duplicate objects that have animation attached to them. When you do, the animation attached to the objects is also copied or duplicated. If you copy or duplicate a group, the copy of the group can be ungrouped to individual objects, just like the original.

For information about copying and duplicating objects, see pages 20-40 and 20-41.

Copying animation without copying objects

If you have attached animation to an object, you can copy the animation and paste it onto another object. If the object has more than one type of animation, all animation is copied and pasted. Note that you can only copy animation to an object that supports the same type of animation.

To copy and paste animation

1. Select the object that has the animation you want to copy.
2. On the Edit menu, click Copy Animation, or right-click the object and then click Copy Animation.
3. Select the objects to copy the animation to.
4. On the Edit menu, click Paste Animation.

   To paste to a single object, you can right-click the object and then click Paste Animation.

Setting up animation for global objects

FactoryTalk® View global objects allow you to link the appearance and behavior of a graphic object to multiple copies of that object. When the original base object is updated, the changes are automatically applied to all the copies of the object. For information about creating base objects, see page 25-10.

The copies of the object are called reference objects, and they have the same properties as the original base object. If desired, you can assign unique animation to the reference object. For information about creating reference objects, see page 25-12.

The LinkAnimation property determines whether the reference object uses the base object's animation.

To set up animation for a reference object

1. Double-click the reference object to open the Property Panel.
2. Select the LinkAnimation property setting to use:
   - **Do not link**—allows you to set up separate animation for the reference object.

- **Link with expressions**—the reference object uses the animation and tags or expressions assigned to the base object.
- **Link without expressions**—allows you to use only the types of animation set up for the base object, but assign different tags or expressions to the reference object.

3. If you selected Do not link or Link without expressions, set up animation for the object using the methods described in this chapter.

For more information about setting up link properties and working with reference objects, see page 25-13.

23 Using expressions

This chapter describes:

- the types of expression components.
- using the Expression editor.
- which editors use expressions.
- formatting expressions.
- using tag names and tag placeholders with expressions.
- using constants.
- using operators.
- using math, security, and language functions.
- using if-then-else logic in expressions.
- the evaluation order of operators.
- using write expressions.

About expressions

Sometimes the data you gather from devices is meaningful only when you:

- compare it to other values.
- combine it with other values.
- create a cause-effect relationship with other values.

Expressions allow you to create mathematical or logical combinations of data that return more meaningful values. Depending on the components used in the expression, the value returned can be in the form of a numeric value, a true/false value, or a text string.

Expressions that result in floating-point values

If an expression results in a floating-point value but an integer value is required, the floating-point value is rounded.

For information about how values are rounded, see page 7-2.

Expression components

Expressions can be built from:

- tag values.
- tag placeholders.
- constants.
- arithmetic, relational, logical, and bitwise operators.
- mathematical and security functions.
- if-then-else logic.

Tags, arithmetic operators, bitwise operators, and mathematical functions such as SQRT (square root) return numeric values.

Relational and logical operators return true/false values. The security function CurrentUserHasCode(*x*) also returns a true/false value.

The security function CurrentUserName( ) returns a string value. The language function CurrentLanguage( ) returns a string value.

Expressions that use if-then-else logic can return numeric values, true/false values, or text strings, depending on how they are structured. These are called conditional expressions because the result of the expression depends on whether the If statement is true or false. When the If statement evaluates to true, the result is defined by the Then statement. When the If statement is false, the result is defined by the Else statement.

The Objects 5 Screen Demo sample application contains many examples of expressions. For example, see the alarm trigger expressions in the Alarm Setup editor.

Using the Expression editor

To create an expression, you can:

- type it directly in the "Tag or expression" column, for any connection that accepts expressions, or in the Expression box (for animation).
- open the Expression editor, and then create the expression in the editor.

Using the Expression editor versus typing expressions directly

Once you are familiar with expression syntax, you might find it quicker to create short expressions by typing them directly in the "Tag or expression" column.

The Expression editor allows you to see more text at once, which is useful for longer, more complicated expressions. Also, you can click buttons to enter tag names, operators,

and functions, thus avoiding typing mistakes. Another advantage of using the Expression editor is that you can check whether the syntax of the expression you've created is valid.

To create an expression by typing it directly

- Type an expression up to 16,000 characters long.

Expressions that you type directly are not checked for syntax.

To open the Expression editor, do one of the following

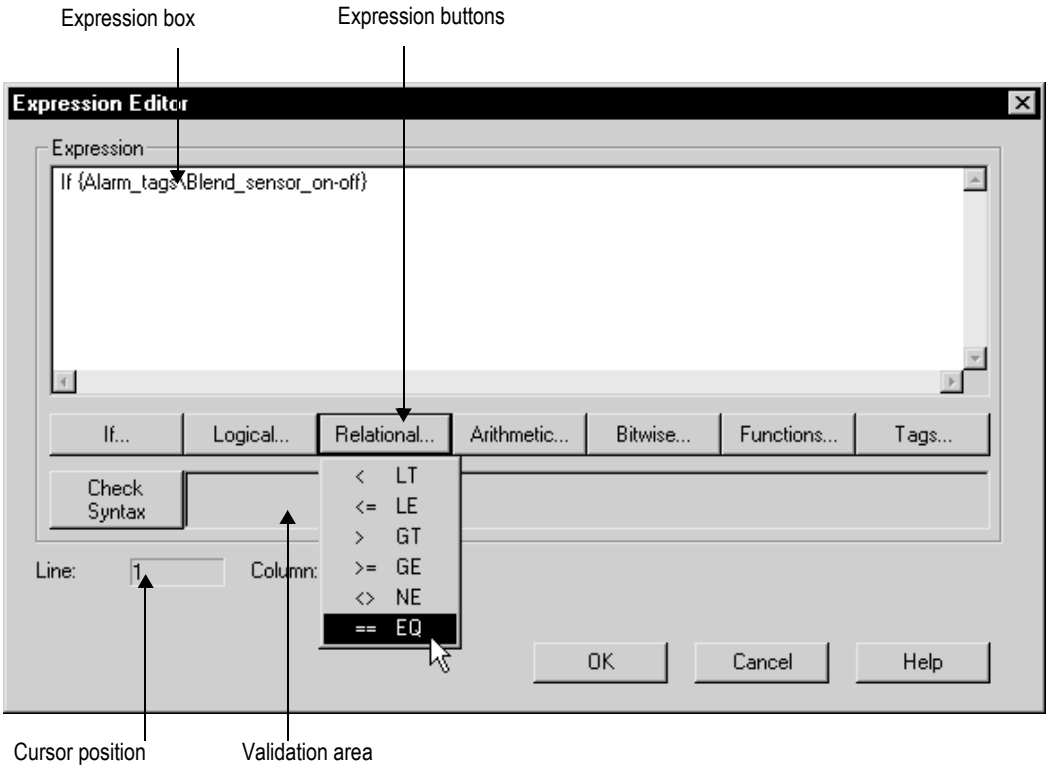
Browse button in the Exprn column

- Click the Browse button in the Exprn column for a connection that accepts expressions.

  The Browse button is not available for connections to which you can assign only tags.

- In the Animation dialog box, click the Expression button.

The Expression editor has these parts:



For details about using the options in the Expression editor, see Help.

Where you can use expressions

You can use expressions in these editors:

- Graphics—You can define an expression to control various aspects of a graphic object's appearance. For more information about assigning expressions to graphic objects, see page 20-35.

  You can also use expressions to attach animation to graphic objects. For more information, see Chapter 22.

- Global Connections—You can use expressions to remotely control when to open and print displays, as well as the date and time to display. For more information, see Chapter 8.

- Alarm Setup—When setting up alarms, you can use expressions for alarm triggers, and with some of the connections that silence and acknowledge alarms. For more information, see Chapter 9.

- Information Setup—You can use expressions to determine when to display information messages. For more information, see Chapter 27.

- Macros—You can use expressions in macros to assign values to tags. For more information, see page 30-1.

Formatting expressions

You can format expressions so they are easier to read. However, do not let tag names, function names, or function arguments span more than one line.

When formatting expressions, you can use line returns and multiple spaces.

Enclose strings in quotes. The string can contain any character, and can include spaces.

Example: Formatting an expression

To format this if-then-else statement, you can align the Else with the appropriate If, so the logic is easy to understand:

```
if (tag1 > tag2) then 0
else if (tag1 > tag3) then 2
else 4
```

Or you can condense it to the following:

```
if (tag1 > tag2) then 0 else if (tag1 > tag3) then 2 else 4
```

Using tag names and tag placeholders

A tag name can be included as part of an expression or can stand alone as the entire expression.

To supply a tag name, do one of the following:

- Type a tag name.

  You can type a tag name that does not exist in the tag database. When you click OK, you are prompted to create the tag. You can create it now, or write down the name and create it later.

- Click the Tags button and select a tag from the Tag Browser.

Enclose tag names that contain dashes or start with a number in braces { } when you use them in an expression. This distinguishes the characters in the tag name from the characters in the expression.

You can use string tags as operands with the plus (+) arithmetic operator and with the relational operators.

Using tag placeholders instead of tag names

The Graphics editor accepts tag placeholders instead of tag names. Placeholders allow you to use the same display with different sets of tags.

You can use tag placeholders in:

- the graphic display that opens when the application is first run.
- graphic displays that are opened using a goto display button.
- graphic displays that are opened using a display list selector.
- the graphic display that is opened by a logout button.
- the graphic that is opened when auto logout is used.
- graphic displays that are opened using the Remote Display Number global connection.

Use parameter files to specify which tags or folders to substitute for which placeholders. For global objects, you can specify the tags or folders of tags using global object parameters. For more information about using parameter files and global object parameters, see Chapter 25.

The tag placeholder can replace any part of a tag name, including folder names. For example, you could create a parameter file specifying that the tag placeholder #1=Folder1. You could assign the folder and a tag name to a graphic object's connection: #1\Tag1.

To create a tag placeholder in an expression

- Type the cross-hatch character followed by a number (no space in between). For example, #1.

Constants

A constant can have any of the following formats:

- integer (123)
- floating-point (123.45)
- string constant ("character string")

Arithmetic operators

Arithmetic operators perform math on two or more numeric values and calculate the result. The arithmetic operators are:

Symbol	Operator	Example (For these examples, tag1 = 5 and tag2 = 7)
+	addition	tag1 + tag2 returns a value of 12 You can also use this operator with string operands. See page 23-7.
-	subtraction	tag1 - tag2 returns a value of -2
*	multiplication	tag1 * tag2 returns a value of 35
/	division	tag1 / tag2 returns a value of 0.7142857
MOD,%	modulus (remainder)	tag2 MOD tag1 returns a value of 2 The modulus operator is the remainder of one number divided by another. In the example, the remainder of 7 divided by 5 is 2; so 7 % 5 = 2 **Important**: This operator is for integers only, not floating-point numbers.
**	exponent	tag1 ** tag2 returns a value of 78125

Be sure that any tag value you use as a divisor cannot at some point have a value of zero. Expressions that attempt to divide a number by zero produce an error at run time.

String operands

The + operator can be used to join string operands. For example, the expression “hello” + “world” returns: helloworld.

You cannot join string tags to analog tags, whether they are HMI or data server tags.

Relational operators

Relational operators compare two numeric or string values to provide a true or false result. If the statement is true, a value of 1 is returned. If false, 0 is returned.

The relational operators are:

Symbols	Operator	Numeric Example	String Example
For the numeric examples, tag1 = 5 and tag2 = 7 For the string examples, serial_no = “ST009”			
EQ, ==	equal	tag1 == tag2 false	serial_no == “ST009” true
NE, <>	not equal	tag1 <> tag2 true	serial_no <> “ST011” true
LT, <	less than	tag1 < tag2 true	serial_no < “ST011” true
GT, >	greater than	tag1 > tag2 false	serial_no > “ST011” false
LE, <=	less than or equal to	tag1 <= tag2 true	serial_no <= “ST011” true
GE >=	greater than or equal to	tag1 >= tag2 false	serial_no >= “ST011” false

How string operands are evaluated

String operands are evaluated by case and by alphabetical order. Lower case letters are greater than upper case letters. For example, h is greater than H. Letters later in the alphabet are greater than those earlier in the alphabet. For example, B is greater than A.

Logical operators

Logical operators determine the validity of one or more statements. There are three logical operators: AND, OR, and NOT. The operators return a non-zero value if the expression is true, or a 0 if the expression is false.

Any statement that evaluates to a non-zero value is regarded as true. For example, the statement tag1 is false if the value of tag1 is 0, and true if tag1 has any other value.

The logical operators are:

Symbols	Operator	Action	Example (For these examples, tag1 = 5 and tag2 = 7)
AND, &&	and	Returns a 1 if the statements to the right and left of the operator are both true.	(tag1 < tag2) AND (tag1 == 5) Both statements are true; returns a 1.
OR, ||	or	Returns a 1 if either the statement to the left or right of the operator is true.	(tag1 > tag2) OR (tag1 == 5) tag1 == 5 is true; returns a 1.
NOT	negation	Reverses the logical value of the statement it operates on.	NOT (tag1 < tag2) Although tag1 < tag2 is true, NOT reverses the logical value; returns a 0.

The parentheses are essential in the above expressions. They determine the evaluation order of the operators. For more information, see page 23-10.

Bitwise operators

Bitwise operators examine and manipulate individual bits within a value.

These operators are for integers only, not floating-point numbers. Do not use them with tags or expressions that return floating-point values.

Symbol	Operator	Action (for examples, see page 23-10)
&	And	Compares two integers or tags on a bit-by-bit basis. Returns an integer with a bit set to 1 if both the corresponding bits in the original numbers are 1. Otherwise, the resulting bit is 0.

Symbol	Operator	Action (for examples, see page 23-10)
|	inclusive OR	Compares two integers or tags on a bit-by-bit basis. Returns an integer with a bit set to 1 if either or both of the corresponding bits in the original numbers are 1. If both bits are 0, the resulting bit is 0.
^	exclusive OR (XOR)	Compares two integers or tags on a bit-by-bit basis. Returns an integer with a bit set to 1 if the corresponding bits in the original numbers differ. If both bits are 1 or both are 0, the resulting bit is 0.
>>	right shift	Shifts the bits within an integer or tag to the right. Shifts the bits within the left operand by the amount specified in the right operand. The bit on the right disappears. Either a 0 or a 1 is shifted in on the left, depending on whether the left-most bit is a 0 or a 1, and whether the operand consists of a signed or unsigned data type. For signed data types, if the left-most bit is 0, a 0 is shifted in. If the left-most bit is 1, a 1 is shifted in. In other words, the sign of the number is preserved. For unsigned data types, a 0 is always shifted in.
<<	left shift	Shifts the bits within an integer or tag to the left. Shifts the bits within the left operand by the amount specified in the right operand. The bit on the left disappears and 0 always shifts in on the right. See “Using the left shift operator,” later in this chapter.
~	complement	Returns one’s complement; that is, it toggles the bits within an integer or tag. Reverses every bit within the number so every 1 bit becomes a 0 and vice versa.

Using the left shift operator

If the left bit is a 1 an overflow occurs, and an error message is generated. To prevent this, use the bitwise AND operator with the left shift operator in an expression. For example:

(dev << 1) & 65535

where dev is a tag whose value is being shifted left, and 65535 is 1111 1111 1111 1111 in binary form.

Examples: Bitwise operators

For these examples, tag1 = 5 (binary 0000 0000 0000 0101) and tag2 = 2 (binary 0000 0000 0000 0010)

tag1 & tag2
Returns 0 (binary 0000 0000 0000 0000).

tag1 | tag2
Returns 7 (binary 0000 0000 0000 0111).

tag1 ^ tag2
Returns 7 (binary 0000 0000 0000 0111).

tag1 >> 1
Returns 2 (binary 0000 0000 0000 0010).

tag1 << 1
Returns 10 (binary 0000 0000 0000 1010).

~ tag1
Returns -6 (binary 1111 1111 1111 1010).

Evaluation order of operators

Expressions with more than one operator are evaluated in this order:

- Operators in parentheses are evaluated first.

  Therefore, to change the order of precedence, use parentheses.
- The operator with the highest precedence is evaluated next.
- When two operators have equal precedence, they are evaluated from left to right.

Operators are evaluated in this order:

Evaluation order	Symbols
1 (highest)	( )
2	NOT ~
3	* / MOD, % ** AND, && & >> <<
4	+ - OR, || | ^
5 (lowest)	EQ, == NE, <> LT, < GT, > LE, <= GE, >=

Examples: Evaluation order

For these examples, tag1 = 5, tag2 = 7, and tag3 = 10.

(tag1 > tag2) AND (tag1 < tag3)

is evaluated in this sequence:

1. tag1 > tag2 = 0
2. tag1 < tag3 = 1
3. 0 AND 1 = 0

The expression evaluates to 0 (false).

---

tag1 > tag2 AND tag3

is evaluated in this sequence:

1. tag2 AND tag3 = 1
2. tag1 > 1 = 1

The expression evaluates to 1 (true).

NOT tag1 AND tag2 > tag3 ** 2

is evaluated in this sequence:

1. NOT tag1 = 0
2. 0 AND tag2 = 0
3. tag3 ** 2 = 100
4. 0 > 100 = 0

The expression evaluates to 0 (false).

Mathematical functions

Use math functions to calculate the square root, log (natural or base 10), or trigonometry ratios (in radians or degrees) of a tag.

This function	Returns this value
SQRT (expression)	The square root of the expression
LOG (expression)	The natural log of the expression
LOG10 (expression)	The base ten log of the expression
SIN (expression)	The sine of the expression in radians
COS (expression)	The cosine of the expression in radians
TAN (expression)	The tangent of the expression in radians
ARCSIN (expression)	The arc sine of the expression in radians
ARCCOS (expression)	The arc cosine of the expression in radians
ARCTAN (expression	The arc tangent of the expression in radians
SIND (expression)	The sine of the expression in degrees
COSD (expression)	The cosine of the expression in degrees
TAND (expression)	The tangent of the expression in degrees
ARCSIND (expression)	The arc sine of the expression in degrees
ARCCOSD (expression)	The arc cosine of the expression in degrees
ARCTAND (expression)	The arc tangent of the expression in degrees

Security functions

Use security functions to control access to your application.

These functions allow you to determine a user's identity or security rights in order to limit access to the application based on these criteria.

This function	Returns this value
CurrentUserHasCode (*Security Code Letters*)	True (1) if any of the specified security codes have been assigned to the user; false (0) if not. If checking multiple security codes, do not type a space between the security code letters. For example: CurrentUserHasCode (ABP) returns the value 1 if the user has been assigned one or more of the specified codes.
CurrentUserName( )	A string containing the name of the current user. This function is case sensitive. All RSView® 3.20 and earlier user names use uppercase letters.

For more information about setting up security for your application, see Chapter 11.

For an example of using the CurrentUserHasCode(*x*) function, see page 11-11. For examples of using the CurrentUserName( ) function, see page 11-24.

Language function

The language function shows you which language your application is currently using.

You can display the current language in a string display, or use it in expressions to generate language-specific messages for your users.

This function	Returns this value
CurrentLanguage( )	RFC1766 name of the current run-time language.

The RFC1766 name is a standard way of representing a language using the format: *languagecode-Country/RegionCode*

where *languagecode* is a lowercase two-letter code and *Country*/*RegionCode* is an uppercase two-letter code.

For example, U.S. English is en-US.

For more information about setting up languages for your application, see Chapter 12. For a list of RFC1766 names, see Appendix F.

Language switching alarm, information, and local messages in FactoryTalk View ME Station 4.00

FactoryTalk View 5.00 and later provides direct support for switching message languages at run time. For applications that will run in FactoryTalk View ME Station version 4.00, you can use the CurrentLanguage( ) expression function to set up language switching for messages. To do this, set up trigger value offsets for series of messages in the Alarm Setup editor, information message files, and local message files.

Export the text strings in the Alarm Setup editor and message files for translation. Then paste the translated strings into the editor and original message files, and assign each string the correct trigger value. For information about exporting text for translation, see Chapter 12.

Example: Setting up information messages in multiple languages

This example shows how to generate English, French, or German information messages at run time in an FactoryTalk View ME Station 4.00 application, depending on which language the application is using.

1. Create a tag called *Information_messages* that will generate trigger values of 11 to 20 for different conditions that require information messages.
2. Create an information message file.
3. Create English messages for trigger values 11 to 20.

   Tip: Messages are sorted alphanumerically in the Excel spreadsheet or Unicode text file created for translation. Therefore, numbers 2 through 9 would appear after 10, 11, 12, and so on. To keep your messages in order in the translation file, begin the first series of numbers at 11.
4. Create French messages for trigger values 21 to 30.
5. Create German messages for trigger values 31 to 40.
6. Assign this expression to the Value connection in the Information Setup editor:

```
If CurrentLanguage( )=”en-US” then Information_messages
Else If CurrentLanguage( )=”fr-FR” then Information_messages + 10
Else Information_messages + 20
```

If-then-else

If-then-else expressions carry out an action conditionally or branch actions depending on the statements in the expression. The if-then-else statements enable the expression to perform different actions in different situations and to repeat activities until a condition changes.

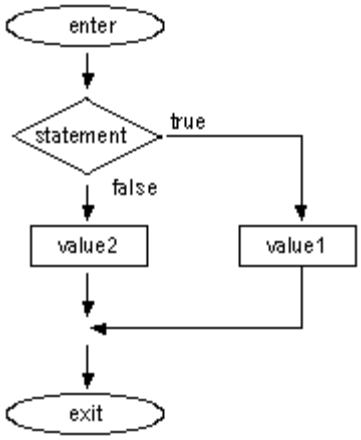
To build conditional expressions, use the relational operators and the logical operators for the statement and values.

The if-then-else structure is:

if *statement* then *value1* else *value2*

If the statement is true then the expression returns value1; if the statement is false then the expression returns value2. If the result of the statement is a non-zero value, the statement is true (and returns value1); if the result is 0, the statement is false (and returns value2).

The if-then-else structure is illustrated here.



Nested if-then-else

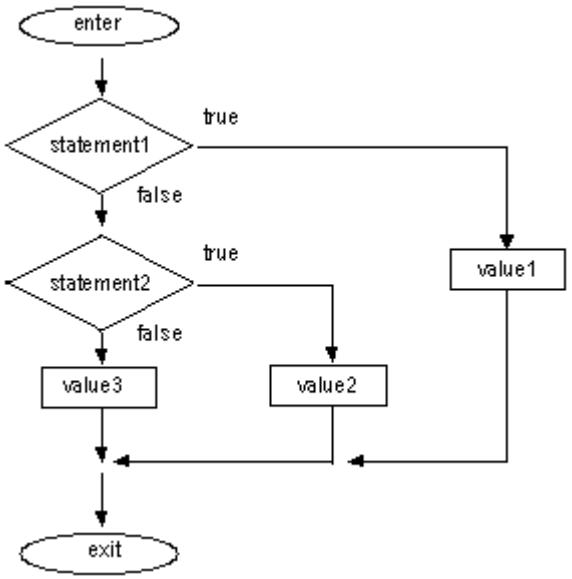
You can also nest an if-then-else structure inside the Then or Else part of an if-then-else structure.

Example 1: Nested if-then-else

This expression:

if *statement1* then *value1*
else if *statement2* then *value2*
else *value3*

has this interpretation:

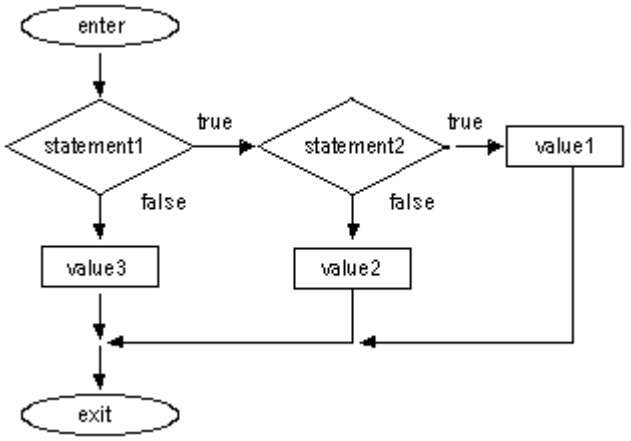


Example 2: Nested if-then-else

This expression:

if *statement1* then
if *statement2* then value1
else *value2*
else *value3*

has this interpretation:



Using write expressions

Write expressions allow the operator to enter a value which is manipulated by an expression before being sent to the data source. FactoryTalk® View substitutes the value the operator enters for the placeholder in the expression, calculates the value of the expression, and writes the result to the Value connection. All write expressions must contain a question mark (?) as a placeholder for the value the operator enters.

You can use write expressions with the numeric input enable button and the numeric input cursor point. When the operator presses the button or cursor point, a keypad or scratchpad opens. The operator enters a value in the keypad or scratchpad, and this value is substituted for the ? placeholder in the write expression.

Example: Using write expressions

In this example, the operator regulates the speed of a conveyor belt by entering a value in feet or meters per second. When the operator enters the value in meters per second, the value is converted to feet per second before being passed to the data source.

The operator first indicates whether the value is in feet or meters by pushing a maintained push button. The push button has one state corresponding to feet per second, and the other state to meters per second.

Then the operator presses the numeric input enable button and enters the value for the conveyor speed in a numeric pop-up keypad. The ? character in the write expression is the placeholder for the value the operator enters.

To set up the maintained push button

1. In the Maintained Push Button Properties dialog box, in the States tab, set up these states:
   - State 0—Value: 0, Caption: Feet/S
   - State 1—Value: 1, Caption: Meters/S
2. In the Connections tab, assign a digital tag called Feet_or_meters to the Value connection (either an HMI tag or a data server tag).

To set up the numeric input enable button

1. In the Numeric Input Enable Properties dialog box, in the Label tab, type the caption “Enter conveyor speed”.
2. In the Connections tab, assign a tag called Conveyor_speed to the Value connection.
3. Assign this expression to the Optional Exp connection:

   ```
   if Feet_or_meters == 0 then

   ?

   else

   ? * 3.281
   ```

FactoryTalk View writes the result of the expression to the Conveyor_speed tag at the data source.

24 Using embedded variables

This chapter describes:

- the types of embedded variables.
- where you can create embedded variables.
- creating embedded variables.
- embedded variable syntax.
- how embedded variables are updated at run time.
- how embedded variables are displayed at run time.

About embedded variables

Embedded variables allow you to display values that change dynamically at run time. You can use embedded variables in the text captions on graphic objects, in the title bar of On Top displays, and in message text. You can use multiple embedded variables in the same caption or message.

For example, you could embed a tag value and the time variable in a local message. At run time when the local message is displayed, it is updated to reflect the tag's current value as the value changes. The time is also updated as the time changes.

You can also use literal strings and constants in embedded variables, or a combination of both variable and literal strings and numbers.

Embedded variables can consist of:

- numeric (analog or digital) tags, including both HMI and data server tags.
- literal numbers (constants).
- string tags, including both HMI and data server tags.
- literal strings (static text).
- tag placeholders. For information about tag placeholders, see page 20-37.
- the time.
- the date.

Where you can create embedded variables

You can create embedded variables in these editors:

- Graphics—Use this editor to insert embedded variables in the captions for graphic objects. For graphic objects with multiple states, you can insert different embedded variables in each state's caption.

  You can also use embedded variables in the title bar for On Top displays.

  For information about specific graphic objects, see Chapter 21. For information about On Top displays, see page 19-12.

- Local Messages—Use this editor to insert embedded variables in local messages.

  For more information about local messages, see page 19-26.

- Information Messages—Use this editor to insert embedded variables in information messages.

  For more information about information messages, see Chapter 27.

- Alarm Setup—Use this editor to insert embedded variables in alarm messages.

  For more information about alarms, see Chapter 9.

Creating embedded variables

To create an embedded variable in a graphic object's caption

1. Open the graphic object's Properties dialog box.
2. Click the tab containing the Caption box.

   The Caption box is on the Label tab or the States tab, depending on the type of object.

   For text objects, use the Text box on the General tab.
3. Click Insert Variable.
4. Click the type of variable to insert.
5. Fill in the options in the dialog box that opens. For details about the options, see Help.

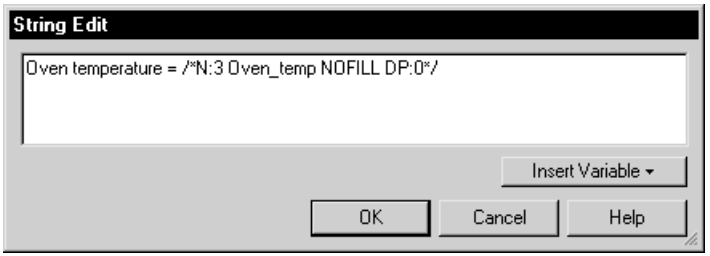
To create an embedded variable in an On Top display's title bar

1. Open the Display Settings dialog box.
2. Select the Title Bar check box if it is not already selected.
3. Click Insert Variable.
4. Click the type of variable to insert.

5. Fill in the options in the dialog box that opens. For details about the options, see Help.

To create an embedded variable in a message

1. In the Message column of the Local Messages, Information Messages, or Alarm Setup editor, right click and then click Edit String.



2. Click Insert Variable.
3. Click the type of variable to insert.
4. Fill in the options in the dialog box that opens. For details about the options, see Help.

Embedded variable syntax

Embedded variables are case sensitive, and must use specific syntax to work. Otherwise, the embedded variable is treated as a piece of text. Therefore, we do not recommend creating and editing embedded variables manually. Instead, use the Insert Variable and Edit Variable dialog boxes.

Numeric embedded variable syntax

Use numeric embedded variables to insert analog or digital tag values into captions, title bars, and messages. You can use both HMI and data server tags.

You can also insert “literal” numbers to display a constant or to specify a tag placeholder in the caption or message.

Numeric embedded variables use this syntax:

/*LN:# *Tag_name Fill_character* DP:#*/

where

L (optional) indicates it is a literal (constant) number. This symbol prevents a tag read. If you type a tag placeholder for the *Tag_name*, the value of the placeholder is substituted from the parameter file or global object parameter definition.

N indicates it’s a numeric embedded variable.

# indicates the number of digits.

Tag_name is the tag to display; you can also type a literal number or tag placeholder here.

Fill_character is the fill character to use: NOFILL, ZEROFILL, or SPACEFILL.

# indicates the number of decimal places.

Examples: Numeric embedded variable syntax

To display the current value of a tag called Oven_temp, with 3 digits, no decimal places, and no fill character, type this:

/*N:3 Oven_temp NOFILL DP:0*/

To display the constant 48, with 3 decimal places and 2 zeroes to the left of the number (for a total length of 8 digits including the decimal), type this:

/*LN:8 48 ZEROFILL DP:3*/

At run time the numeric embedded variable would look like this: 0048.000.

String embedded variable syntax

Use string embedded variables to insert string tag values into captions, title bars, and messages.

You can also insert "literal" strings of static text. For example, you can type a word or phrase, a tag placeholder, or a number. To control how constant numbers are displayed, use a literal numeric variable rather than a string variable.

String embedded variables use this syntax:

/*LS:-# *Tag_name* SHOWSTAR*/

where

L (optional) indicates it is a literal (static) string. This symbol prevents a tag read. If you type a tag placeholder for the *Tag_name*, the value of the placeholder is substituted from the parameter file or global object parameter definition. The value cannot contain spaces.

S indicates it's a string embedded variable.

- (optional). A minus sign (-) before the # indicates that if the string is longer than the fixed number of characters, the right-most characters will be displayed.

# indicates the number of characters if you select a fixed number of characters; type 0 if you don't want to use a fixed number.

Tag_name is the tag to display; you can also type a literal string or tag placeholder here. The string cannot contain spaces.

SHOWSTAR (optional) specifies that if the string is longer than the fixed number of characters, an asterisk (*) will be displayed to indicate the string is truncated. If you use the minus sign (-), the asterisk will be displayed as the first character at the left end of the string. Otherwise, the asterisk will be displayed as the last character at the right end of the string.

Examples: String embedded variable syntax

To display the current value of a string tag called Blower_status, with a fixed length of 20 characters, you would type this:

/*S:20 Blower_status*/

To display the literal string Oven temperature, type this:

/*LS:20 “Oven temperature”*/

To display the literal string 36.5, type this:

/*LS:3 36.5*/

To assign the tag placeholder #1, without a fixed string length, type this:

/*S:0 #1*/

To display the value of the string tag Conveyor_message, with a fixed length of 40, displaying the right-most characters, with an asterisk to indicate if the message is truncated, type this:

/*S:-40 Conveyor_message SHOWSTAR*/

Time and date embedded variable syntax

Use time and date embedded variables to insert the current time or date into captions, title bars, and messages

Time and date embedded variables use this syntax:

/**Time_date_format**/

where

Time_date_format uses one of these character sequences:

These characters	Specify this format
SD	Short date
LD	Long date
SDT	Short date and time
LDT	Long date and time
T	Time
TSD	Time and short date
TLD	Time and long date

Example: Time and date embedded variable syntax

To display the time followed by the short date, you would type this:

/*TSD*/

A space is placed between the time and date when the embedded variable is displayed at run time.

How embedded variables are updated at run time

At run time, this is how embedded variables are displayed and updated:

- Graphic objects and title bars—When a display containing a graphic object or title bar that uses an embedded variable is open, the value of the embedded variable is updated whenever a new tag value is read from the data source. For time and date embedded variables, the time and date are updated as the system time and date change.

- Local messages—When a display containing a local message display object is open, and the message the object is displaying contains an embedded variable, the value of the embedded variable is updated whenever a new tag value is read from the data source. For time and date embedded variables, the time and date are updated as the system time and date change.
- Information messages—The value of the embedded variable is read when the information message is first displayed. It is not updated after that.

  If the message is printed, it is printed using the value the variable had when the message was first displayed. This value is retained if you shut down and restart the application.
- Alarm messages—The value of the embedded variable is read when the alarm occurs, and is displayed in the message associated with the alarm. It is not updated after that.

  If the message is printed, it is printed using the value the variable had when the alarm first occurred. This value is retained if you shut down and restart the application.

How embedded variables are displayed at run time

If there is no valid data available for the embedded variable, the variable is replaced with question marks (?). This could occur when a display first opens and the data has not arrived yet, or when there is a problem that prevents communication with the data source.

If a string or numeric embedded variable has been set up but no tag has been assigned, the embedded variable is replaced with asterisks (*).

Numeric embedded variables

The value shown for a numeric embedded variable depends on whether the tag value is a floating-point number or an integer. Integer values are displayed as is. Floating-point values are rounded to fit the specified number of digits for the variable.

For example, if the variable is set up to show 6 digits, 1234.56 is rounded to 1234.6. 1234.44 is rounded to 1234.4. The decimal counts as one of the digits.

For more information about how values are rounded, see page 7-2.

If the tag value, including the decimal point and minus sign, contains more digits than specified for the variable, the numeric variable is replaced with asterisks.

For example, if the variable is set up to show 6 digits, and the tag value is -123456, the variable will be replaced with asterisks.

Literal numbers are displayed using the same rules as numeric tag values.

Number formats

The numeric variable uses the number format of the current application language. For example, if the application language uses a comma for the decimal symbol, the numeric variable uses a comma for the decimal symbol.

For information about using multiple languages, see Chapter 12.

String embedded variables

For string embedded variables that do not use a fixed number of characters, the entire string tag value is displayed, unless a null character is read. Nothing after a null character is displayed.

If a fixed number of characters is used, the variable displays the value of the tag up to the number of characters specified, unless a null character is encountered before the specified length. Nothing is displayed after a null character. If necessary, spaces are used to make up the required number of characters.

Null characters have a hex value of 0. The null character indicates the end of string input. It does not add to the actual string length.

If the string is longer than the specified number of characters, it is truncated to fit the number of characters. If the SHOWSTAR option is used, an asterisk (*) replaces the first or last character displayed. If the embedded variable is set up to display right-most characters, excess characters are truncated at the left end of the string and the asterisk (if used) appears at the left. Otherwise, the right-most characters are truncated and the asterisk (if used) appears at the right.

Literal strings are displayed using the same rules as string tag values.

Time and date embedded variables

For embedded variables that show both the time and the date, a space is placed between the time and date when the embedded variable is displayed at run time.

Time and date formats

Time and date embedded variables use the time and date formats for the current application language. For example, if you specify the short date format, at run time the display uses the short date format that the application language uses.

For information about using multiple languages, see Chapter 12.

25 Using parameters and global objects

This chapter describes:

- using tag placeholders and parameter files or lists.
- creating tag placeholders.
- creating parameter files and parameter lists.
- using global objects.
- creating global object displays and base objects.
- creating, setting up, and deleting reference objects.
- using global object parameters.
- adding process faceplates that connect to Logix5000 processors.

The topics in this chapter describe features of FactoryTalk® View Studio that can help you set up your applications more quickly by reusing similar groups of objects and graphic displays.

- Tag placeholders, parameter lists, and parameter files allow you to use the same graphic display with different sets of tags.
- Global objects allow you to use multiple instances of the same graphic object and make changes to all of the objects at once.
- Global object parameters allow you to assign different sets of tags to different copies of the object without breaking the link to the base object, thus preserving the ability to update all copies of the object at once.
- Process faceplates provide pre-configured graphic displays that interact with the instructions in Logix5000 processors.

Using tag placeholders

Use a tag placeholder to mark where you want to insert a tag name or some part of a tag name at run time. A tag placeholder is a crosshatch character (#) followed by a number from 1 to 500.

FactoryTalk View Machine Edition uses three methods for replacing a tag placeholder with a tag name:

- parameter files
- parameter lists

- global object parameters

To use the same graphic display with different sets of tags, use tag placeholders with parameter files or parameter lists. Using tag placeholders can be quicker than duplicating a display and setting up the objects in it to use a different set of tags, especially when the display uses a lot of tags. Using parameter files or parameter lists also reduces the size of the run-time application file.

You can use tag placeholders wherever you would normally assign a tag to an object, including in expressions and embedded variables. You can also use tag placeholders in the expressions you create to animate objects.

Tag placeholders can provide a way to use one graphic display to represent a number of similar operations. For example, suppose you are creating displays for a plant that cans corn and peas. The machinery used in both processes is identical. Instead of creating two displays and specifying corn-related tags in one display and pea-related tags in another, you can create one display and not specify any tag names. Where a tag name is required, type a tag placeholder.

Use parameter files or parameter lists to specify which tags to substitute for which placeholders when a display opens at run time. For information about using parameter files, see page 25-4. For information about using parameter lists, see page 25-7.

You can also use tag placeholders with global objects. You can assign tag placeholders to the connections for base objects, and to connections for reference objects with the LinkConnections property set to False. For more information about global objects, see page 25-10.

You can use tag placeholders in:

- the graphic display that opens when the application is first run. Specify the graphic display to open, and the parameter file or parameter list to use with it, in the Startup editor.
- graphic displays that are opened using goto display buttons. Specify the graphic display to open, and the parameter file or parameter list to use with it, when you set up the button.
- graphic displays that are opened using display list selectors. Specify the graphic displays to open, and the parameter files or parameter lists to use with them, when you set up the display list selector.
- the graphic display that opens when a logout button is pressed.
- the graphic display specified in the Project Settings Runtime tab when auto logout is enabled.
- displays specified in the Display tab of the Global Connections editor.

Summary of steps

Follow these steps to use tag placeholders with parameter files or parameter lists:

1. In the Graphics editor, create graphic objects and assign tag placeholders to the objects.
2. If you are using parameter files, create parameter files in the Parameters editor for each set of tags that the display will use. In the parameter files, specify which tags to substitute for which placeholders.
3. In the Graphics editor, create goto display buttons, logout buttons, or display list selectors for opening the display containing tag placeholders. Specify the appropriate parameter files in the graphic objext's dialog box. To use parameter lists, specify the tags for the lists in the dialog box.

   For information about setting up goto display buttons, see page 21-35. For information about setting up display list selectors, see page 21-37. For information about setting up buttons, see page 21-17.
4. If the startup display uses tag placeholders, in the Startup editor, specify the parameter file to use with the startup display. To use a parameter list, specify the tags for the list in the Startup editor.

   For information about the Startup editor, see Chapter 14.
5. If auto logout is enabled, you have the option of opening a display on logout. Specify the appropriate parameter file in the Runtime tab of the Project Settings dialog box. To use a parameter list, specify the tags for the list in the Project Settings dialog box.

   For information about the Project Settings editor, see Help.
6. If the displays that will be changed remotely by global connections use parameters, specify the parameter file or parameter list in the Display tab of the Global Connections editor.

   For information on global connections, see Chapter 8.

Creating tag placeholders

A tag placeholder is the crosshatch character (#) followed by a number.

The tag placeholder can replace any part of a tag name, including folder names. For example, you could create a parameter file specifying that the tag placeholder #1=Folder1. You could assign the folder and a tag name to a graphic object's connection: #1\Tag1.

You can create tag placeholders in:

- the Connections tab of an object's Properties dialog box.

- the Connections tab of the Property Panel.
- the Expression box in the Animation dialog box.
- a global object's Parameter Definitions dialog box.
- anywhere that you can insert an embedded variable. For information about embedded variables, see Chapter 24.

To create a tag placeholder

- Type the cross-hatch character followed by a number from 1 to 500 (no space in between). For example, #1.

Creating parameter files

The parameter file specifies which tags to substitute for the placeholders in the display, by assigning one tag to each unique placeholder in the display. Create a parameter file for each set of tags that you want to use with the same graphic display.

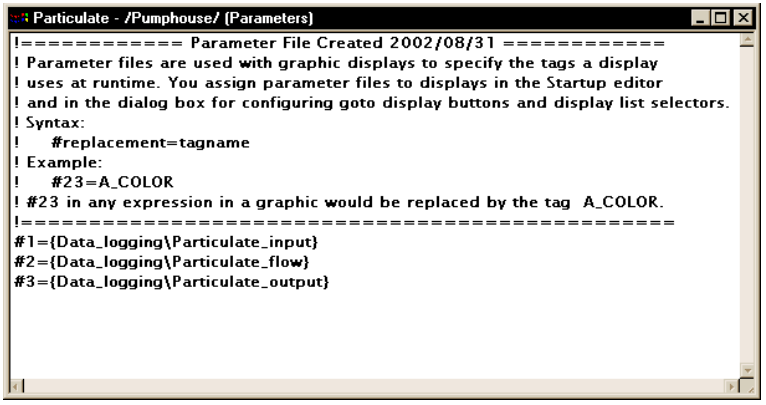
At run time, the tag values that are displayed depend on which parameter file is used when the display opens. When you open the display, the tags specified in the parameter file replace the tag placeholders.

Parameters can replace any portion of a tag address. For example, you can use parameters to replace folder names.

Parameter files can list up to 500 tag placeholders. Use them when a large number of tag placeholders are needed for a display. The text format of a parameter file allows you to see and edit the placeholders easily. When copying displays from one application to another, the related parameter files must also be copied.

Using the Parameters editor

Use the Parameters editor to create one or more files of tag placeholder replacements. Each file is stored in the editor's folder. You can open and work on multiple parameter files at the same time.


Particulate - /Pumphouse/ (Parameters)
!============ Parameter File Created 2002/08/31 ============
! Parameter files are used with graphic displays to specify the tags a display
! uses at runtime. You assign parameter files to displays in the Startup editor
! and in the dialog box for configuring goto display buttons and display list selectors.
! Syntax:
! #replacement=tagname
! Example:
! #23=A_COLOR
! #23 in any expression in a graphic would be replaced by the tag A_COLOR.
!==
#1={Data_logging\Particulate_input}
#2={Data_logging\Particulate_flow}
#3={Data_logging\Particulate_output}

For details about using the Parameters editor, see Help. To open the Help, press F1 on your keyboard.

Example: Using a parameter file to replace tag placeholders

This example shows how to use a graphic display called Canning Overview with two sets of tags, one for canning corn, and one for canning peas.

The Canning Overview display is opened from a graphic display called Main Menu.

1. Create these sets of tags. You can use both HMI and data server tags.

Tag type	Tag name	Tag name
String	Corn_Name	Pea_Name
Analog	Corn_Temp	Pea_Temp
Analog	Corn_Weight	Pea_Weight
Analog	Corn_Level	Pea_Level

2. Create two parameter files, called Corn and Peas, containing these parameters:

Corn	Peas
#1=Corn_Name	#1=Pea_Name
#2=Corn_Temp	#2=Pea_Temp
#3=Corn_Weight	#3=Pea_Weight
#4=Corn_Level	#4=Pea_Level

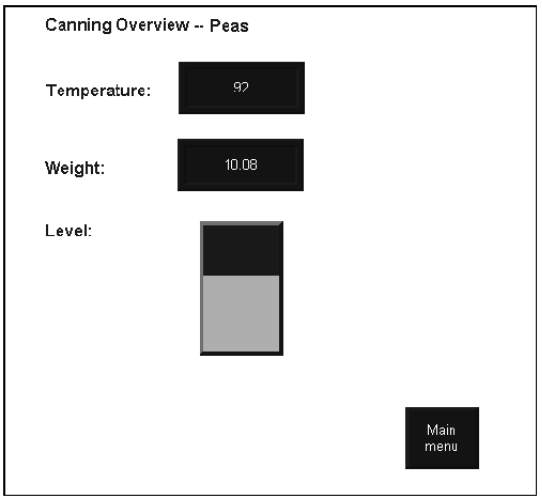
3. In the Canning Overview display, assign tag placeholders to the Value connections for these graphic objects:

This graphic object	Uses this tag placeholder
String display	#1
Numeric display 1	#2
Numeric display 2	#3
Bar graph	#4

4. Use descriptive text to illustrate the objects in the display.
5. In the Main Menu display, create a display list selector for opening the Canning display, with two states.
6. Assign the Corn parameter file to one state, and the Peas parameter file to the other.
7. Call the captions for the states Corn and Peas, respectively.

At run time, when the operator selects the Peas state on the display list selector in the Main Menu, and presses the Enter key, the Canning Overview display opens and shows the values of the Pea_ tags. When the operator selects the Corn state, the values of the Corn_ tags are displayed.

The Canning Overview display looks like this when the operator selects the Peas state:



Creating parameter lists

You create parameter lists by selecting the tags as you set up the objects that will open the displays that use them. The first tag in the list will replace placeholder #1, the second tag in the list will replace #2, and so on. A parameter list stays with the object when it is copied or duplicated, and with the graphic display in which it is created, when the display is copied or moved.

Parameter lists can be used anywhere that parameter files can be used. The parameter list option appears in:

- the States tab of the Display Selector object
- the General tab of the Logout button and Goto Display button objects
- the Initial graphic option on the Startup editor
- the Runtime tab of the Project Settings editor
- the Display tab of the Global Connections editor

Parameter lists are defined in the object on the display. If the display or the object is copied or imported to another application, the parameter list stays with the object.

Follow these steps to use tag placeholders and parameter lists:

1. In the Graphics editor, create graphic objects and assign tag placeholders to the objects.
2. In the dialog box where the parameter list option appears, click on the Browse button to open the Tag Browser.
3. Select the first tag or folder to add to the list and click OK. The tag or folder name appears in the parameter list text box. At run time, this tag replaces placeholder #1.
4. To add another tag to the list, repeat steps 2 and 3. Each tag in the parameter list box is separated from the previous tag by a comma. At run time, the second tag replaces placeholder #2, the third tag replaces placeholder #3, and so on.

Example: Using a parameter list to replace tag placeholders

This example shows how to use a graphic display called Canning Overview with two sets of tags, one for canning corn, and one for canning peas.

The Canning Overview display is opened from a graphic display called Main Menu.

1. Create these sets of tags. You can use both HMI and data server tags.

Tag type	Tag name	Tag name
String	Corn_Name	Pea_Name
Analog	Corn_Temp	Pea_Temp
Analog	Corn_Weight	Pea_Weight
Analog	Corn_Level	Pea_Level

2. In the Canning Overview display, assign tag placeholders to the Value connections for these graphic objects:

This graphic object	Uses this tag placeholder
String display	#1
Numeric display 1	#2
Numeric display 2	#3

This graphic object	Uses this tag placeholder
Bar graph	#4

3. Use descriptive text to illustrate the objects in the display.
4. In the Main Menu display, create a display list selector for opening the Canning display, with two states.
5. In the first state, choose the parameter list option and select the Corn parameter tags from the Tag Browser in this order: Corn_Name, Corn_Temp, Corn_Weight, Corn_Level. In the second state, do the same for the Peas tags.
6. Call the captions for the states Corn and Peas, respectively.

At run time, when the operator selects the Peas state on the display list selector in the Main Menu, and presses the Enter key, the Canning Overview display opens and shows the values of the Pea_ tags. When the operator selects the Corn state, the values of the Corn_ tags are displayed.

Parameter passing

You can use parameter files or parameter lists to pass (carry forward) parameters from one display to other related displays that open from it. To carry the same parameter forward to subsequent displays, assign the same tag placeholder (for example, #1), instead of a tag name in the parameter list or parameter file field of the object in the related display.

Example: Using a parameter list to replace tag placeholders in linked displays

This example uses PIDE faceplate displays to demonstrate parameter passing.

The main, or first level display, is called MAIN. It has a goto display button that opens a Logix_PIDE faceplate display. The faceplate has a goto display button that opens a Trend faceplate.

In the Main display, the goto display button has the parameter list option on the General tab selected, and a structure tag name, with a shortcut, selected from the Tag Browser to represent #1: {::[PLC1] Program:Fermenter_Temp.Tank_PIDE01}, for example.

When the button is pressed, the Logix_PIDE faceplate opens. The objects on the faceplate have been set up to read the tags in the structure: #1.CV, #1.SP, and so on. The objects

replace the parameter #1 with the structure tag name and then derive their values from the structure elements they have been set up to read.

To carry the same parameters forward another level, the goto display button on the Logix_PIDE faceplate display has the parameter list option on its General tab selected, and the parameter {#1} typed in. When this button is pressed, the Trend faceplate opens, and its objects in turn replace their #1 parameters with the same structure tag name, and read their values from the appropriate elements.

Using global objects

FactoryTalk View global objects allow you to link the appearance and behavior of a graphic object to multiple copies of that object. When you update the original object, the changes are automatically applied to all the copies of the object.

You create global objects in global object displays, in the Global Objects folder of the Explorer window. The objects you create in a global object display are called base objects.

You can copy or drag base objects into standard graphic displays. The copied object is called a reference object. You can copy a global object into any number of graphic displays, and multiple times into the same graphic display.

Global object displays have the file extension .ggfx. They are stored in this default location.

\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME\HMI projects*Application Name*\Global Objects (Windows XP or Windows Server 2003 R2)

or

\Users\Public\Public Documents\RSView Enterprise\ME\HMI projects*Application Name*\Global Objects (Windows Vista,Windows 7 Professional or Windows Server 2008)

where *Application Name* is the name of your application.

Summary of steps

Follow these steps to set up global objects:

1. In the Graphics editor, create a global object display. For more information, see the next section.

2. Create graphic objects in the global object display. These are the base objects. Set up their appearance, animation, and connections.
3. Copy or drag base objects into a standard graphic display. The copied objects are reference objects. For more information, see page 25-12.
4. Edit the link properties of the reference objects as desired. For more information, see page 25-13.

Creating global object displays and base objects

You can create a global object display in the Global Objects folder, or create a graphic display in the Displays folder and then add the display to the Global Objects folder. You can also add library displays to the Global Objects folder.

The objects you create in the global object displays are called base objects.

To create a global object display

1. In the Graphics folder, right-click Global Objects, and then click New.
2. Create graphic objects in the display. These are the base objects.

   You cannot use ActiveX objects as base objects. You cannot convert objects to wallpaper in the global object display.

   For information about creating graphic objects, see Chapter 20.

Save tool

3. On the File menu click Save, or click the Save tool.
4. In the Component name box, type a name for the display, and then click OK.

   The display is added to the list in the Global Objects folder.

To add a display or library to the Global Objects folder

1. In the Explorer window, in the Graphics folder, right-click the Global Objects icon.
2. Click Add Component Into Application.
3. Browse to and select the display or library to add, and then click Open.

   The display is copied into the Global Objects folder, and given the file extension .ggfx.

   Any ActiveX objects are deleted. All other objects are converted to base objects.

If you delete, remove, or rename a global object display, you break the links between the base objects in the display and their reference objects. For more information about breaking links, see Help.

Creating reference objects

FactoryTalk View global objects allow you to link the appearance and behavior of a graphic object to multiple copies of that object. When the original base object is updated, the changes are automatically applied to all the copies of the object. The copies of the base object are called reference objects.

You can copy or drag base objects into standard graphic displays. Each copied object becomes a reference object. You can also copy, drag, and duplicate reference objects that you have already created to create more copies of the base object.

Base objects can be group objects. This provides powerful template capabilities. When you add or remove objects from the base object group, all the reference objects are automatically updated.

If desired, you can assign unique connections, animation, and size to the reference object.

To create a reference object

1. Copy an object from a global object display to a standard graphic display.
2. To assign unique connections, animation, or size to the object, double-click the object to open the Property Panel.

   For information about using the Property Panel, see page 20-29.

You can also create reference objects by adding a global object display to the Displays folder. All the objects in the new display are reference objects.

To add a global object display to the Displays folder

1. In the Explorer window, in the Graphics folder, right-click the Displays icon.
2. Click Add Component Into Application.
3. Browse to and select the global object display to add, and then click Open.

   The display is copied into the Displays folder, and given the file extension .gfx. All the objects are converted to reference objects.

To edit a reference object's base object

1. Right-click the reference object, and then click Edit Base Object.
2. The global object display containing the base object opens, with the object selected.
3. Make your changes to the base object.

All reference objects linked to the base object are updated.

To view the changes to the reference object, close the display containing the reference object, and then reopen it. Or, toggle the object's LinkSize property on and off.

Setting up reference objects' link properties

FactoryTalk® View global objects allow you to link the appearance and behavior of a graphic object to multiple copies of that object. When the original base object is updated, the changes are automatically applied to all the copies of the object.

The copies of the object are called reference objects, and they have the same properties as the original base object. If desired, you can assign unique size, connections, and animation to the reference object.

To assign unique properties to the reference object, use the Property Panel to edit the following properties for the reference object:

- LinkSize—select False to set up the height and width separately for the reference object. If LinkSize is set to true, when you try to resize the reference object, it will snap back to its linked size.
- LinkConnections—select False to set up connections separately for the reference object. Whether you use the base object's connections, or set up separate connections, the tags used count towards the tag limit for the display.

  You can assign tag placeholders to the connections for base objects, and to connections for reference objects with the LinkConnections property set to False.
- LinkAnimation—select Do not link to set up separate animation for the reference object. To use the animation set up for the base object but assign different expressions to the reference object, select Link without expressions.

  If you select Link with expressions, the reference object uses the animation and expressions assigned to the base object.

Reference objects also have a property called LinkBaseObject, which specifies the name and location of the base object to which the reference object is linked. You cannot edit the LinkBaseObject property.

To change a reference object's link properties

1. Double-click the object to open the Property Panel.
2. Make your changes to the link properties.
3. Specify the new size, connections, or animation for the object.

For information about resizing objects, see page 20-42. For information about assigning connections to objects, see page 20-30. For information about assigning animation to objects, see Chapter 22.

To specify default link properties for reference objects

1. On the Edit menu, select Global Object Defaults.
2. Specify the new default values.
3. Click OK.

   The defaults are used for any new reference objects you create. You can still edit the properties for individual objects separately.

To break the link to a base object

- Right-click the reference object, and then click Break Link.

  The reference object becomes a regular object. You can edit all of its properties. However, you cannot restore the connection to the base object.

Deleting the base object

If you delete a base object or a global object display containing base objects, any reference objects that are linked to the deleted base objects are broken. A broken reference object is displayed as a red square with an X through it. You cannot edit broken reference objects.

To repair a broken reference object

- Recreate the base object with the same object type and name as before, on the same display as before.

Using global object parameters

Global object parameters are parameters that you can assign to global objects. You can use a global object parameter to assign different tags or sets of tags to each reference object without breaking the link to the base object. You can then make changes to the base object and all the associated reference objects at the same time.

Use global object parameters when more than one instance of a global object is used on a display. For example, the Logix_PIDE global object display contains a grouped object composed of other grouped objects. The objects' connections are set up with tags and expressions that use values from a set of Logix5000 tags. When you create multiple reference objects from this base object, each reference object can use a different set of Logix5000 tags. The global object parameters you assign to the base object allow you to do this, because you are using a placeholder instead of a specific backing tag (a backing tag is a path to a folder of tags; it is also known as a structured tag). If you then change,

add, or remove a tag or expression in the base object, the same change is made to all the reference objects.

If you don't use global object parameters, you can still assign different tags to different reference objects by changing the reference object's LinkConnections property to False and the LinkAnimations property to Link without expressions.

The global object parameter takes the same form as a regular parameter: #*1*, where *1* can be any number from 1 to 500. The parameter can be the placeholder for an individual tag or for a folder of tags. For example, #1 could be a placeholder for the path to the folder containing the PIDE tags assigned to the global object.

When you set up the base object, specify the global object parameters to use with the object. You can provide a description of each parameter to remind you or another application designer of the type of value to assign to the parameter on the reference object. Then assign specific values to each parameter for the reference object. You can assign numeric or string constants, tags, or backing tags.

Difference between global object parameters and regular parameters

Global object parameters allow you to assign different values to different instances of the same placeholder. For example, each reference object in the display might have the placeholder #1. Using regular parameter files, you could only assign one value to #1, and this would apply to all objects in the graphic display. With global object parameters, you can assign a different value to #1 for each object that uses the placeholder #1.

If a placeholder is defined in a global object parameter for an individual object and defined in a parameter file, the definition assigned to the object takes precedence.

Using global object parameters with group objects

To use global object parameters with a group object, the parameters are defined at the group level, not at the level of individual objects. Thus the definition applies to each object within the group. You can assign as many parameters as desired to the group. For example, you might assign #1 to some members of the group and #2 to other members of the group. If you create a global object parameter definition for an object and later group the object, the definition is deleted. In addition, if you create a global object parameter definition for a group and then ungroup the object, the definition is deleted.

Values are assigned to the global object parameters at the group level as well. You cannot assign separate values to individual objects in the group.

Summary of steps

Follow these steps to use global object parameters:

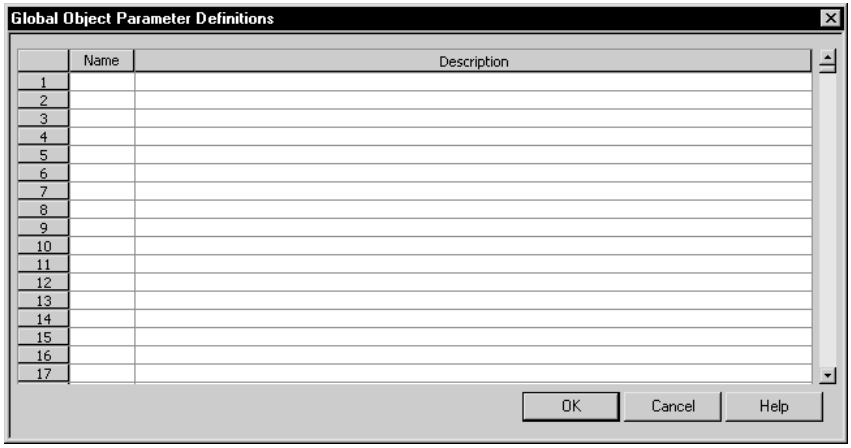
1. In the global object display, assign placeholders and parameter definitions to the base object. For details, see the next section.
2. In the standard graphic display, select the reference object and specify the value to use for each parameter. For more information, see page 25-12.

To specify global object parameters for the base object

1. Create placeholders in each place where you want to use a global object parameter. You can create the placeholders anywhere a tag or expression is required.

   You can also type placeholders in embedded variables by using a literal string embedded variable. For information about embedded variables, see Chapter 24.

2. Right-click the global object or grouped global object, and then click Global Object Parameter Definitions.

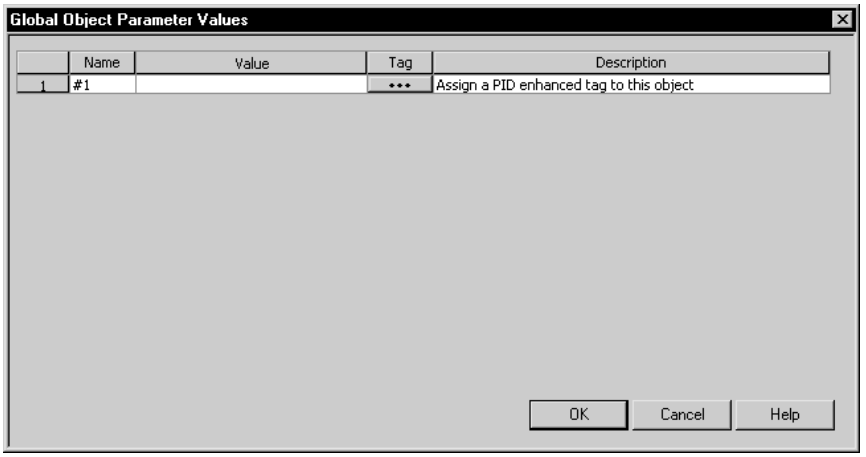


3. Specify a parameter for each placeholder for the object. If desired, type a description for each parameter.

For details about using the Global Object Parameter Definitions dialog box, see Help. To open the Help, press F1 on your keyboard.

To specify the parameter values for the reference object

1. Right-click the reference object or grouped reference object, and then click Global Object Parameter Values.



2. Specify a value for each parameter. The value can be a tag, backing tag, or numeric or string constant. Numeric constants are treated as strings of text.

Using process faceplates

Process faceplates are pre-configured graphic displays and global object displays that interact with Logix5000 processors.

Process faceplates contain graphic objects that display values from a Logix5000 processor and allow operators to interact with the processor. You can use the faceplate graphic displays as stand-alone displays, or copy the faceplate objects into other graphic displays. If desired, you can edit the objects in the faceplates. For example, you might want to add your company logo or change the colors used in the faceplates.

To use a process faceplate, you must add it to your application and specify the path to the Logix5000 processor instructions used by the faceplate. The faceplates are set up so that you can specify the path to the instructions using parameter files. For more information, see the Help for the faceplates, accessible from the Add Process Faceplates dialog box.

FactoryTalk View Studio comes with sets of faceplates that work with these Logix5000 instructions:

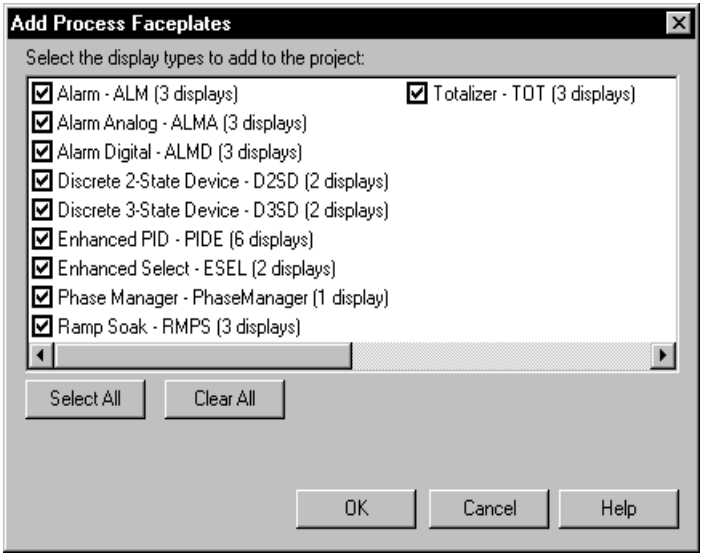
- Enhanced PID (Logix_PIDE)
- Discrete 2-State Device (Logix_D2SD)
- Discrete 3-State Device (Logix_D3SD)
- Totalizer (Logix_TOT)
- Enhanced Select (Logix_ESEL)

- Alarm (Logix_ALM)
- Ramp/Soak (Logix_RMPS)
- PhaseManager (Logix_PhaseManager)

The name in parentheses is the name of the main graphic display and global object display. Other displays in the set are named beginning with this name, followed by a segment describing the purpose of the subdisplay. For example, Logix_ALM has two subdisplays called Logix_ALM_Config and Logix_ALM_Status. When you add process faceplates, any graphic images associated with the faceplates are added to the Images folder

To add process faceplates to an application

1. In the Explorer window, right-click the HMI server, and then click Add Process Faceplates.


Add Process Faceplates
Select the display types to add to the project:
Alarm - ALM (3 displays)
Alarm Analog - ALMA (3 displays)
Alarm Digital - ALMD (3 displays)
Discrete 2-State Device - D2SD (2 displays)
Discrete 3-State Device - D3SD (2 displays)
Enhanced PID - PIDE (6 displays)
Enhanced Select - ESEL (2 displays)
Phase Manager - PhaseManager (1 display)
Ramp Soak - RMPS (3 displays)
Totalizer - TOT (3 displays)
Select All
Clear All
OK
Cancel
Help

   The Add Process Faceplates dialog box opens.

2. Select the faceplates to add.

   For details about selecting options in the dialog box, see Help.

26 Setting up data logging

This chapter describes:

- steps for setting up data logging.
- data log files.
- data log models.
- changing the data log model used at run time.
- displaying data logs using the trend graphic object.
- problems with data logging.

Summary of steps

Follow these steps to set up data logging:

1. In the Data Log Models editor, set up a data log model that specifies how many log values to store, the conditions that trigger data logging, where to log data, and which tags to monitor.
2. In the Startup editor, turn on data logging by selecting the Data logging check box. Also use this editor to specify the data log model to use at run time. See Chapter 14.
3. In the Graphics editor, create a graphic display containing the trend graphic object, and set up how the object looks, which tag values to display, the start time, and the time span for the data. Also specify the name of the data log model to use.

Data log files

As soon as the application starts running, FactoryTalk® View begins logging tag values to the data log files. When the maximum number of data points have been logged, the oldest data is deleted to make room for the new data. FactoryTalk View supplies data from the log files to the trend object for the requested tags and time span.

The data log files are retained when you restart an application after a shutdown or power loss. You can delete the log files from the run-time computer at application startup.

Use data logging to keep a permanent record of tag data. You can record tag data as tag values change, or on a periodic basis (for example, every minute).

For information about deleting the log files, see page 15-16.

File names

FactoryTalk View creates two data log files:

- *Data Log Model Name*.log
- *Data Log Model Name*.tag

You'll need this information if you log to a custom path and want to delete the log files manually.

Data Log Models

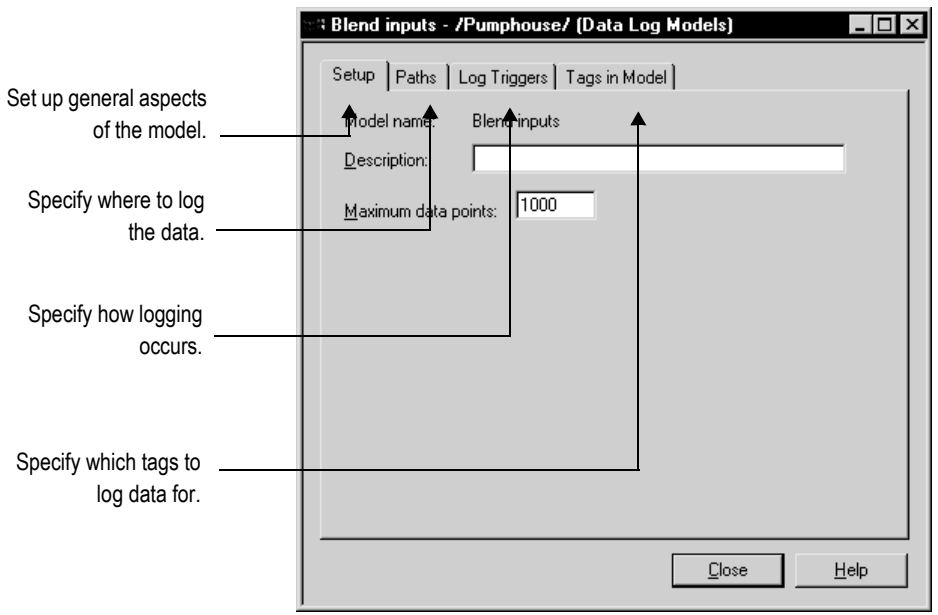
A data log model defines which tags to log data for, as well as how and where the data is logged.

You can set up multiple data log models, but you can run only one data log model at a time. For information about running a different data log model, see page 26-4.

Creating Data Log Models

Use the Data Log Models editor to create one or more data log models. Each data log model is a file stored in the editor's folder—you can open and work on multiple models at the same time

.



For detailed information about the options in the Data Log Models editor, see Help.

Each data log model has a unique name, and an optional description.

You can log a maximum of 300,000 points. When the maximum number of data points have been logged, the oldest data is deleted to make room for the new data.

Data storage locations

You can store data log files in any one of these locations:

- on the run-time computer
- on another computer on the network
- on a compact Flash Card (for PanelView™ Plus or PanelView™ Plus CE terminals only)

If the logging destination is unavailable for any reason, for example, the card is removed or the network drive becomes unavailable, data logging stops. It does not restart until you restart the application.

Logging to a network location

To log data to a network location, the network drive must be shared, and the run-time computer must be logged in to the same domain as the computer on the network. To do this, the user must have access rights for the domain.

The PanelView Plus or PanelView Plus CE terminal cannot be part of a domain. However, you can verify that the user who is logged into the PanelView Plus or PanelView Plus CE terminal is on a user list that is part of a domain.

For more information about logging in to a Windows® domain or authenticating users, see page 17-1.

Data logging methods

There are two methods for triggering data logging. You can set up logging so tag values are logged:

- periodically (periodic logging)
- only when a tag value changes (on-change logging)

Logging periodically

Periodic logging is used to take a snapshot of all tag values at a particular point in time. Tag values are logged even if there has been no change.

You cannot change the periodic log rate at run time.

Logging on change

On-change logging is used to log only tags whose values have changed.

For HMI tags, before logging occurs, the change must equal a specified percentage of change in the tag value. The percentage is based on HMI tags' minimum and maximum values as set up in the Tags editor. Only the tags that change by the specified percentage are logged. If you specify a percentage of 0, all changes are logged.

If a tag does not have a minimum or maximum attribute (for example a data server tag in Logix5000), when you specify on-change logging, all changes are logged for that tag. You don't need to specify a percentage.

Using a heartbeat rate

You can also specify a heartbeat rate, to log values at specified times even if no tag value changes have occurred. The heartbeat ensures that the data in the log file is current. The heartbeat is also a good way to ensure that data logging is working and acquiring valid data.

The heartbeat cannot be less than the maximum update rate, which is the rate at which data servers send tag values to FactoryTalk View.

If you specify a heartbeat of 0, the heartbeat is not used.

Tags in the data log model

The data log model can contain up to 100 analog or digital tags, including both HMI and data server tags.

You cannot use string tags, array tags, tag placeholders, parameters, or expressions in your data log model.

Deleting tags from the model

If you delete a tag from the data log model, previously logged data for the tag is not accessible unless you add the tag back to the model.

Changing the data log model used at run time

Your application can run only one data log model at a time. Follow this procedure to switch data log models.

To run a different data log model

1. Shut down the application.
2. Start FactoryTalk View Studio and open the application.
3. In the Startup editor, specify the new data log model.

4. Create the run-time application. See Chapter 14.
5. Transfer the run-time application to the run-time platform.

   For information about transferring applications to:

   - a personal computer, see Chapter 15.
   - a PanelView Plus or PanelView Plus CE terminal, see Chapter 16.
6. Run the new application.

Displaying data logs using the trend graphic object

You can use the trend graphic object to display the data that you've logged. At run time, when the operator opens a graphic display containing a trend, the trend displays values from the data log file for the data log model that is running. The data log model specifies which data to collect in the data log file.

In addition to displaying historical values from the data log file, trends can display current values for the tags in the model. Trends can also display current values for tags or expressions that are not in a data log model. For more information about trends, see Chapter 28.

Problems with data logging

Problems with data logging occur under these circumstances:

- When your application starts at run time, if any of the tags specified in the current data log model do not exist, an error message is sent to FactoryTalk® Diagnostics.
- If the data log file is corrupted or invalid, the file is deleted and recreated, and an error message is sent to FactoryTalk Diagnostics.
- If logging to a folder on a networked computer, and the run-time computer is not logged in to the Windows domain of the network computer, the log folder cannot be created. An error message is sent to FactoryTalk Diagnostics.
- If logging to an invalid path, the log folder cannot be created. An error message is sent to FactoryTalk Diagnostics. One of the reasons that the path might be invalid is that the top-level folder of the path is not shared.
- When the application starts, FactoryTalk View checks whether there is disk space to store the data log model's data. If there is not enough space, an error message is sent to FactoryTalk Diagnostics and data logging does not start.

27 Using information messages

This chapter describes:

- steps for setting up information messages.
- using the Information Messages and Information Setup editors.
- preparing to set up information messages.
- how information messages work.
- creating information messages in multiple languages.
- the [INFORMATION] display.
- creating your own information message display.
- opening and closing the information message display.
- how the information message display graphic object works.
- changing the information message file used at run time.

About information messages

Use information messages to give the operator messages about the process, prompts or instructions, and information about current states.

Information messages versus local messages

Use information messages to give the operator information no matter which display is open. To give the operator information in a specific graphic display while the display is open, use local messages.

For details about local messages, see page 19-26.

Summary of steps

Follow these steps to set up information messages:

1. In the Information Messages editor, set up the messages and their trigger values.
2. In the Information Setup editor, specify the graphic display to open when information messages occur, and the file of messages to display.

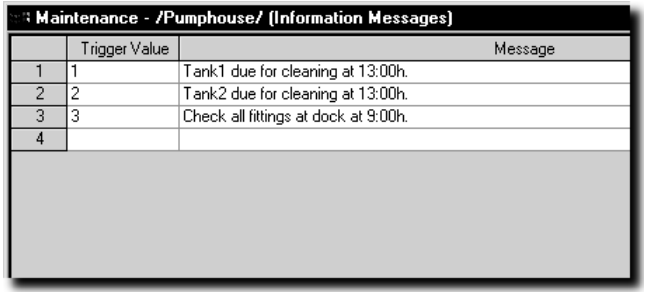
   Also use this editor to assign a tag or expression to the Value connection. If you want the operator to acknowledge messages, assign the Ack connection and specify the acknowledge hold time.

3. In the Startup editor, ensure that the Information messages box is checked (it is checked by default). See Chapter 14.
4. If desired, in the Graphics editor modify the default [INFORMATION] display, or create your own graphic display to use for information messages. For example, if you don't want the operator to acknowledge messages, edit the default display to remove the information acknowledge button.

   For information about graphic displays, see Chapter 19.

Using the Information Messages editor

Use the Information Messages editor to create one or more files of information messages. Each file is stored in the editor's folder. You can open and work on multiple message files at the same time.

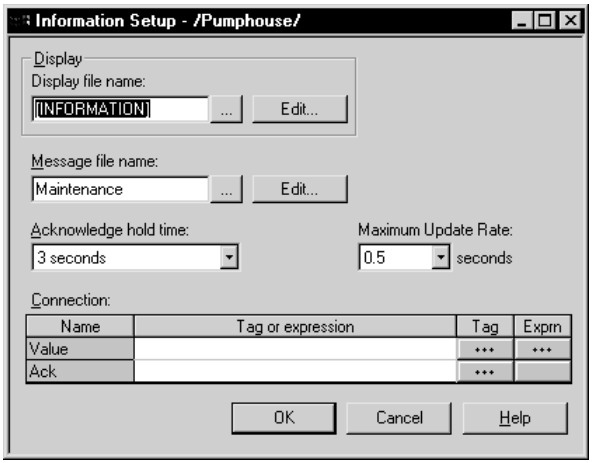


You can define up to 10,000 messages in each message file.

For detailed information about the options in the Information Messages editor, see Help.

Setting up how information messages are displayed

Use the Information Setup editor to set up how information messages are displayed.



For detailed information about the options in the Information Setup editor, see Help.

Preparing to set up information messages

As your application is running, information is continually sent to the data source about the state of various processes. For example, your application might be monitoring whether a valve is open or closed, or the temperature in a boiler. Values representing the status of these processes are sent to the data source.

The data source

The FactoryTalk® View documentation uses the term data source as a generic term that includes all possible sources of tag data, for both data server tags and HMI tags. The data source can be memory or a device such as a programmable controller or an OPC® server. FactoryTalk View writes values to and reads values from the data source. The data source is set up to exchange information (in the form of numeric or string values) between FactoryTalk View and the machine that your application is controlling.

Identifying the tags and values to monitor

To set up information messages, determine which tags associated with machine processes to monitor, and identify the values for those tags that will trigger information messages.

For information about creating tags, see Chapter 7.

How information messages work

These are the key parts of the information message system:

- Information message file—a text file containing a list of messages, with a numeric trigger value for each message
- Information message display—a graphic display that opens at run time and displays information messages
- Value connection—a tag or expression. When the value of this connection matches a message's trigger value, the information message display opens with the associated message displayed.

The following example shows how the key parts of the information message system work together.

Example: Setting up the data source to display information messages

This example shows how to set up the data source to notify the operator that a conveyor belt has stopped. In this example, the status of two conveyor belts is being monitored. You can use both HMI and data server tags.

1. Create a digital tag called Conveyor_1_status. This tag points to an address in a programmable controller that is linked to a sensor on the first conveyor belt. When the belt is running, the tag's value is 0. When the belt stops running, the value changes to 1.
2. Create a second digital tag called Conveyor_2_status. This tag points to an address in a programmable controller that is linked to a sensor on the second conveyor belt. When the belt is running, the tag's value is 0. When the belt stops running, the value changes to 1.
3. Create an analog tag called Information_messages. Set up the data source to send a value of 1 to this tag when Conveyor_1_status has a value of 1, and to send a value of 2 to this tag when the Conveyor_2_status tag has a value of 1.
4. In the Information Messages editor, create these messages with trigger values matching the values that will be sent to the Information_messages tag:

Trigger value	Message
1	Conveyor belt 1 has stopped.
2	Conveyor belt 2 has stopped.

Save the message file with the name “Conveyor belts.”

5. In the Information Setup editor, assign the Information_messages tag to the Value connection, and select the Conveyor belts message file.

At run time, when the value of Conveyor_1_status changes to 1, the first message is displayed (in the default information message display). When the value of Conveyor_2_status changes to 1, the second message is displayed.

Information messages and trigger values

Create messages associated with each tag value change that you want to inform the operator about. Assign each message a trigger value, and set up the data source to send the trigger value to the Value connection. You can use both HMI and data server tags.

The trigger value can be any non-zero integer value (positive or negative). Trigger values do not need to be contiguous, but they must be unique for each message. For example, you could use trigger values of 1, 2, and 3, or values of 10, 20, and 30.

Trigger values cannot be 0. Digital tags have two possible values, 0 and 1. Therefore, if you use a digital tag you can only use the value 1 to trigger a message. If you want to use a digital tag to trigger two different messages, create an expression that adds 1 to the digital tag’s value. That way, you can use the trigger values 1 and 2.

If you use an analog tag or an expression, you can use any non-zero integer or floating-point value to trigger an alarm. Floating-point values are rounded to the nearest integer. For information about how values are rounded, see page 7-2.

You can create multiple information message files, but you can use only one message file at run time. For information about using a different message file, see page 27-8.

Creating information messages in multiple languages

FactoryTalk View 5.00 and later supports information messages in multiple languages. When you create information messages, they are in the current application language. You can export the information messages for translation and then import them back into the application. For details, see Chapter 12.

Language switching information messages in FactoryTalk View ME Station 4.00

For applications that will run in FactoryTalk View ME Station version 4.00, use the CurrentLanguage( ) expression function to specify message offsets in the information message file. In the file, divide your messages into sections for each language. For information about the CurrentLanguage( ) function, see page 23-14.

The [INFORMATION] display

FactoryTalk View comes with an information message graphic display called [INFORMATION]. It contains an information message display graphic object and buttons for acknowledging the displayed message and closing the display. By default, the [INFORMATION] graphic display opens automatically at run time when an information message is generated.

You can use the [INFORMATION] display as is, or modify the display. For example, you can change the color of the objects, or add and remove buttons. Or, you can create your own graphic display to use for displaying information messages. In the Information Setup editor, specify the display to use.

Another option is to place the information message display object in a graphic display that doesn't open automatically when a message is generated.

For information about creating your own information message display, see page 27-7.

The information message display graphic object

The [INFORMATION] display contains an information message display graphic object, which lists one information message at a time.

For information about how the information message display object works at run time, see page 27-7.

Buttons in the [INFORMATION] display

The [INFORMATION] display contains these buttons:

This button	Does this
Ack (information acknowledge)	Acknowledges the information message
Close (close display)	Closes the information message graphic display.

You can assign any caption you choose to the labels on the buttons.

Using the information acknowledge button

When the operator presses the information acknowledge button, if the Ack connection is assigned, the connection value is set to 1 at the data source. The value is held as long as the operator presses the button, or for the acknowledge hold time, whichever is longer. Then the connection is reset to 0.

Creating your own information message display

You can create your own graphic display for displaying information messages, containing an information message display graphic object and the buttons you want to use in the display.

If you create your own graphic display, use an On Top display and select the Cannot Be Replaced option.

For more information about the information message display graphic object, see page 27-7. For information about creating graphic displays and graphic objects, see Chapter 19 and Chapter 20.

Opening and closing the information message display

Opening the display

The information message display you specify in the Information Setup editor (either the default [INFORMATION] display or your own display) is automatically opened whenever the Value connection's value matches a trigger value.

You can also create a goto display button that the operator can press to open the information message display. For information about setting up a goto display button and specifying the display to open, see Help.

Closing the display

The information message display closes when the Value connection's value changes to 0.

To automatically close the display when the operator acknowledges a message, set up the data source to set the Value connection to 0 when the Ack connection is set to 1.

The operator can also close the display by pressing a close display button.

How the information message display graphic object works

At run time, when the Value connection at the data source changes from 0 to a non-zero value, the assigned information message display opens. If the value matches a message's trigger value, the associated information message appears in the information message display graphic object. The object can be in the default [INFORMATION] display, in an

information message display you have created, or can be placed in any display in your application.

For information about setting up the information message display graphic object, see page 21-65.

What is displayed

- If the Value connection is unassigned, the information message graphic display never opens automatically. If the operator opens a graphic display containing an information message display object, the object is blank.
- The Value connection is rounded up to the nearest integer. If the value does not match any of the trigger values in the specified message file, the display is filled with question marks (?).

  For information about how values are rounded, see page 7-2.
- If the message is too long to fit in the information message display object, the last displayed character is replaced with an asterisk (*).
- When the Value connection's value is 0, the information message graphic display is closed.
- If you set up information messages in multiple languages, messages are displayed in the current application language. When a language switch occurs, a message that was already in the information message display remains in the language that it originally appeared in. New messages are displayed in the new language.

Changing the message file used at run time

Your application can use only one message file at a time. Follow this procedure to switch message files.

1. Shut down the application.
2. Start FactoryTalk View Studio and open the application.
3. In the Information Setup editor, specify the new information message file.
4. Create the run-time application. See Chapter 14.
5. Transfer the run-time application to the run-time platform.

   For information about transferring applications to:

   - a personal computer, see Chapter 15.
   - a PanelView™ Plus or PanelView™ Plus CE terminal, see Chapter 16.
6. Run the new application.

28 Setting up trends

This chapter describes:

- what trends are.
- summary of steps for creating a trend graphic object.
- creating trends, and the Trend Object Properties dialog box.
- the parts of the trend graphic object.
- the different chart types.
- choosing colors, fonts, lines, and markers for the trend.
- testing the trend.
- using objects from the Trends graphic library.
- using buttons to control the trend at run time.
- printing trend data.
- run-time errors for trends.

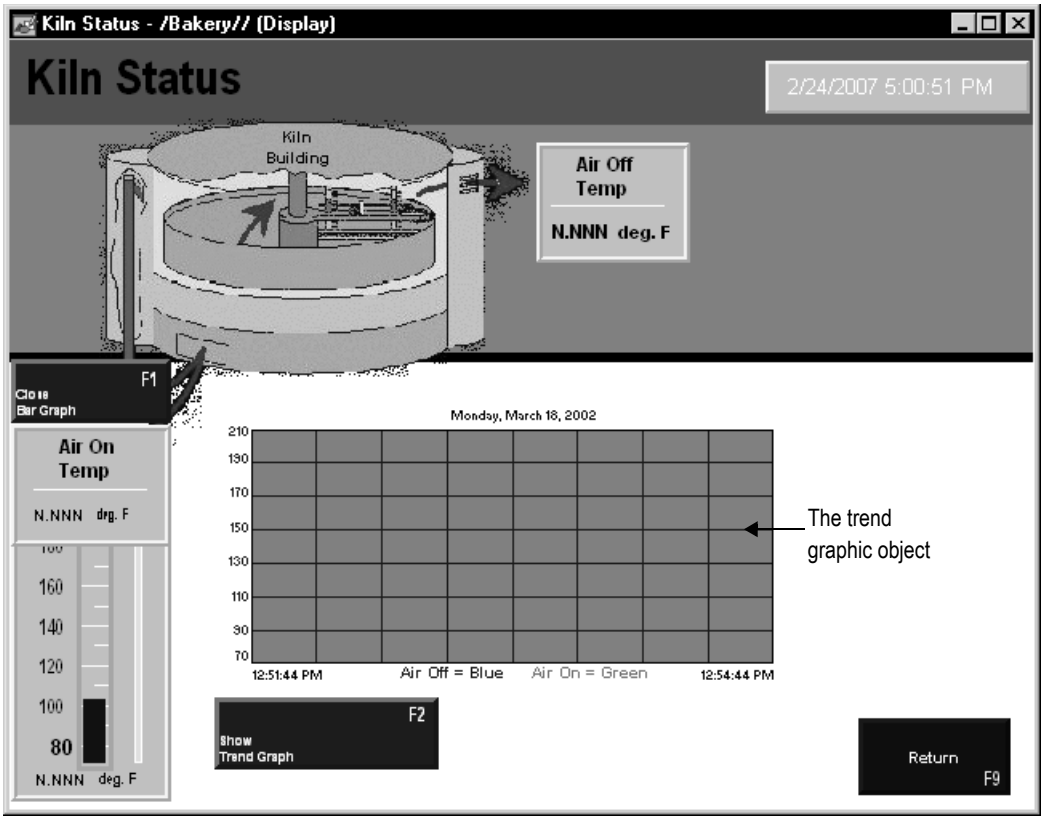
About trends

A trend is a visual representation of current or historical tag values. The trend provides operators with a way of tracking plant activity as it is happening.

You can:

- plot data for as many as eight tags or expressions on one trend.
- create a trend that is part of a graphic display or acts as the entire graphic display.
- plot data over time, or plot one variable against another in an XY Plot chart to show the relationship between them.
- display isolated or non-isolated graphs. Isolated graphing places each pen in a separate band of the chart. With non-isolated graphing, pen values can overlap.
- create buttons to allow the operator to pause, scroll, and print the trend data.

The illustration below shows a trend that has been added to a graphic display. You can view the Kiln Status display by opening the Malthouse sample application



Current versus historical data

The data displayed in a trend can come from two sources. For current values, data comes from the value table as it is collected. The value table is a record of the most recent values collected from the data source, and is stored in temporary memory while the application is running.

For historical values, data comes from a data log model's log file, if a model is assigned to the trend. You can display both current and historical data in the same trend.

For information about data log models, see Chapter 26.

Time, date, and number formats

The trend is displayed using the time, date, and number formats of the current application language. For example, if the application language uses a comma for the decimal symbol, the scale on the y-axis uses commas for the decimal symbol.

For information about using multiple languages, see Chapter 12.

Summary of steps

These are the steps for creating a trend:

1. To plot historical data, create a data log model in the Data Log Models editor. For information, see Chapter 26.
2. Create a trend graphic object in the Graphics editor, as described on page 28-3.
3. Set up the trend in the Trend Object Properties dialog box. For details about the options in the dialog box, see Help.
4. If desired, create a next pen button, a pause button, or key buttons in the same graphic display, to allow the operator to switch between pens, pause the trend, or scroll the trend.

   For information about the buttons you can use with trends, see page 28-11.
5. To keep a printed record of the trend data, provide a way for the operator to print the graphic display. For information see page 28-12.

Creating trend objects

To create a trend object

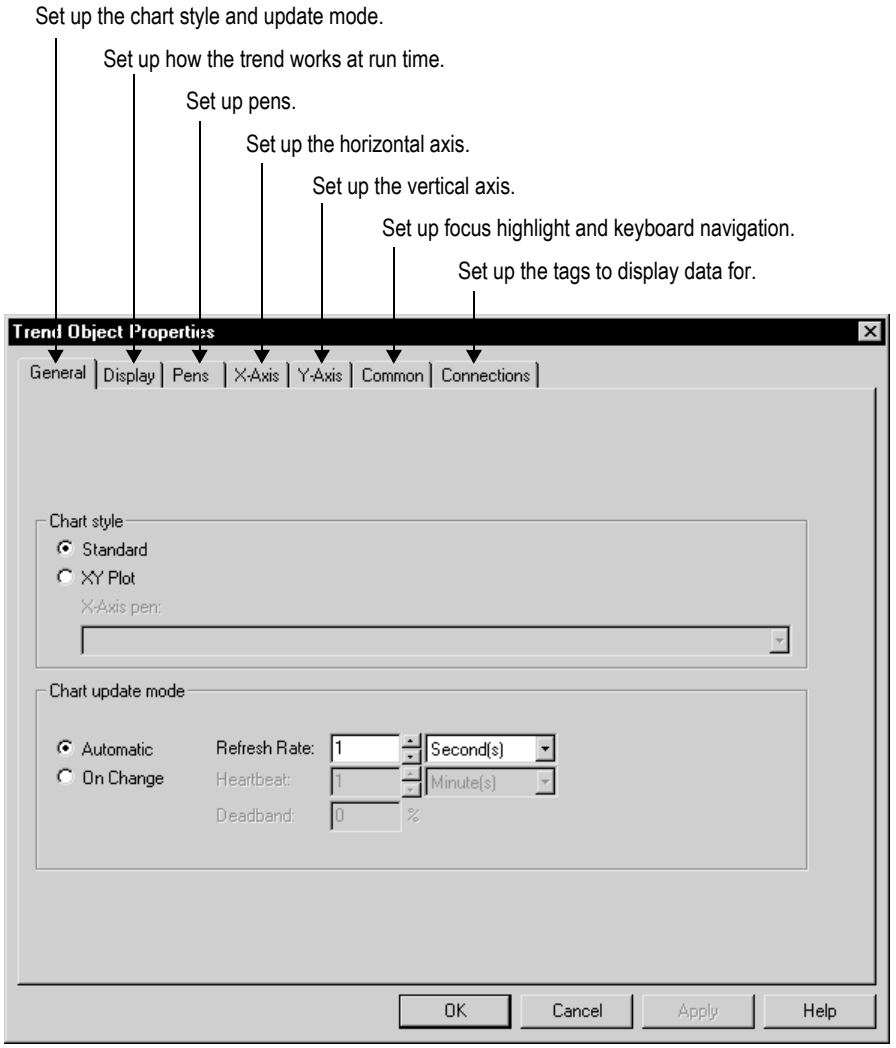
1. In the Graphics editor, create or open a graphic display.
2. Select the Trend drawing tool by doing one of the following:
   - In the Objects toolbox, click the Trend tool.
   - On the Objects menu, select Trending, and then click Trend.
3. Drag the mouse to create a box approximately the size you want for the trend.
4. Double-click the trend to open the Trend Object Properties dialog box.
5. Set up the trend. For details, see Help.

Once you have set up the trend, you can edit it as you would any other graphic object. You can move it, resize it, attach animation to it, and so on. You can also use this object in other graphic displays by dragging it from one display and dropping it into another.

For more information about graphic objects, see Chapter 20.

Setting up trends

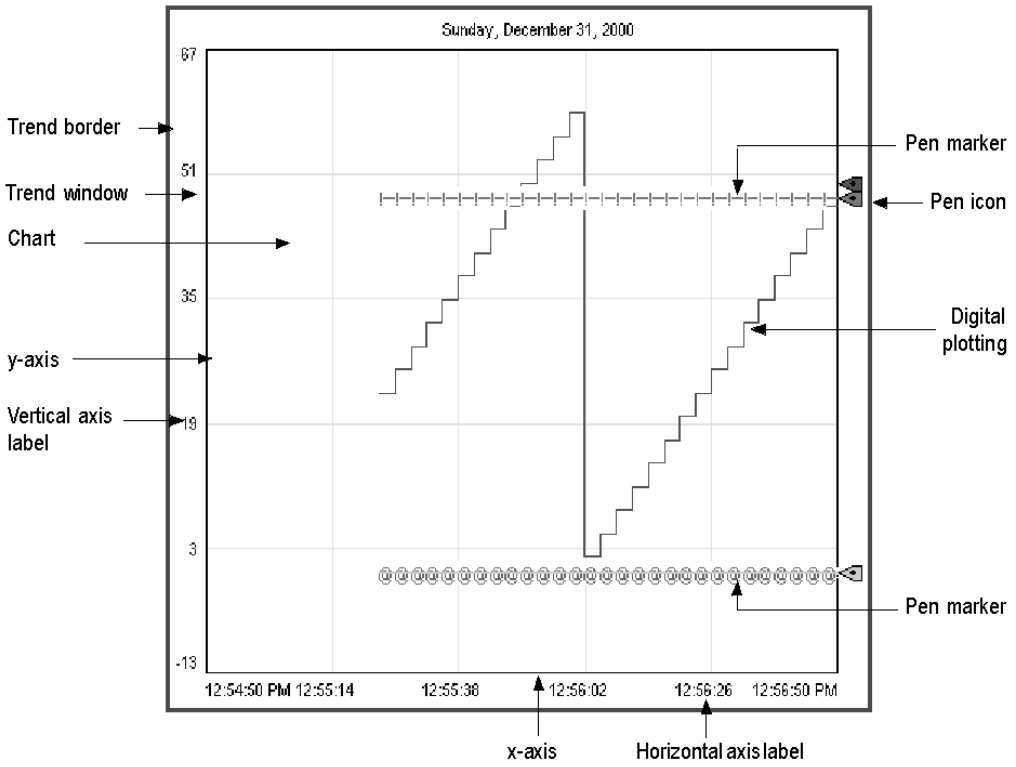
When you double-click a trend object, the Trend Object Properties dialog box opens. Use the dialog box to set up the trend.



For details about the options in the Trend Object Properties dialog box, see Help.

The parts of a trend

The illustration below shows a standard trend chart, with three pens and a two-minute time span. Two of the pens have markers. The third uses digital plotting. For more information about chart types, see page 28-7.



Trend border

The border appears around the trend object at run time when the trend is selected.

Trend window

The area around the chart, between the border and the chart, is the trend window.

Chart

The chart is the area of the trend in which values are plotted. It is bounded by the y-axis on the left and the x-axis on the bottom. It contains the plotted trend data (shown using pen lines and pen markers), as well as grid lines (if you choose to display them).

Y-axis

The y-axis is the left vertical edge of the chart. It is also known as the vertical axis.

Vertical axis labels

The vertical axis labels show the scale (range) of values for the pens. If desired, you can set up the trend to omit the vertical axis labels.

The minimum and maximum values for the scale can be determined automatically (using the best fit for the current data), be derived from a pen's minimum and maximum values, use a constant value, or be controlled by tags.

You can set up the trend so all pens use the same scale, or use individual ranges for each pen. If you choose the latter method, create a next pen button in the graphic display, to allow operators to view the range for each pen. When the operator presses the button, the vertical axis changes to the new pen's range.

For example, if Pen 1 has a minimum value of 10 and a maximum value of 100, the range on the vertical axis is 10 to 100 when the pen is selected. If Pen 2 has a minimum of -10 and a maximum of 50, the range on the vertical axis changes to -10 to 50 when the operator presses the next pen button.

X-axis

The x-axis is the bottom horizontal edge of the chart. It is also known as the horizontal axis.

Horizontal axis labels

For standard charts, the horizontal axis labels indicate the time span covered by the trend. For XY Plot charts, the horizontal axis labels show the scale (range) of values for the pen selected to serve as the x-axis pen.

If desired, you can set up the trend to omit the horizontal axis labels. The number of labels depends on the size of the trend object and the number of vertical grid lines.

Pens

Pens are the lines and symbols used to represent values. The values can be tags you are monitoring, expressions that manipulate tag values, or constants.

If there is no data for a pen, or if the data is outside the vertical axis range, the pen does not appear in the chart.

Pen icons

Pen icons appear at the right edge of the chart at run time, if you choose to display them. The icon's position indicates the pen's most recent recorded value (from the value table), even if the trend is paused or if the most recent value has not been plotted yet.

Pen markers

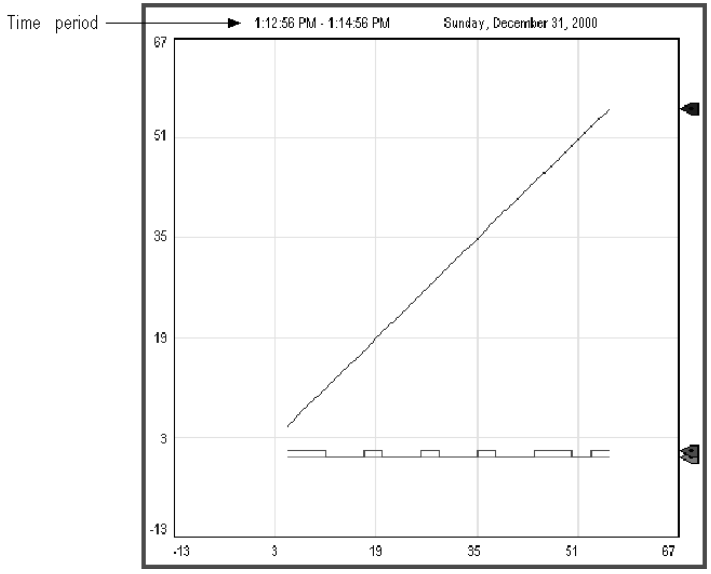
Pen markers are symbols that indicate data points. If data is plotted frequently, the markers might not appear as distinct, separate symbols. For example, see the lowest pen in the illustration on page 28-5.

Chart types

Standard vs. XY Plots

You can create a standard chart, which plots tag values against time, or an XY Plot chart, which plots one (or more) tag's values against another's.

This illustration shows what an XY Plot chart could look like:

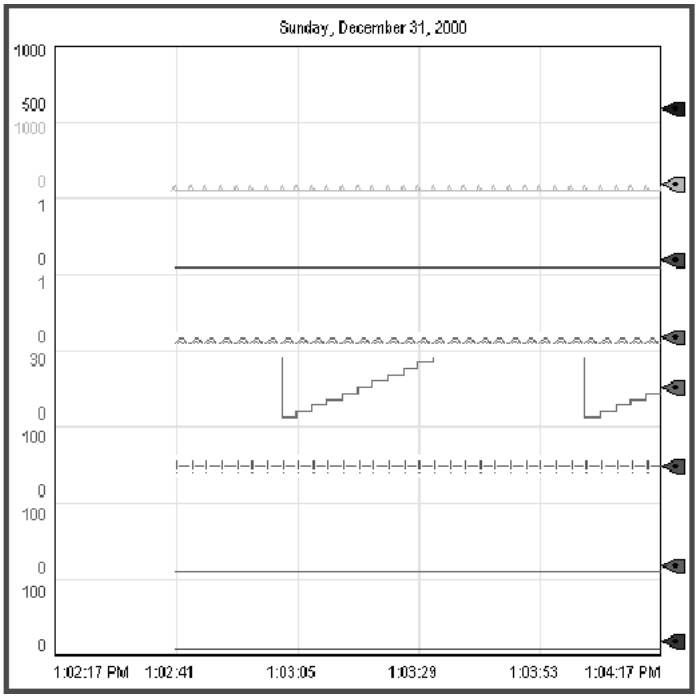


Notice that the horizontal axis labels display the range for the specified x-axis pen. The time period covered by the chart is at the upper left.

Isolated graphing

For charts with multiple pens, you can allow the pen values to overlap, or you can isolate each pen in its own horizontal band on the chart.

This is an example of isolated graphing, with a 10% buffer between each pen's band:



Notice that in this illustration each pen uses its own scale. If desired, you can use the same scale for all pens.

With isolated graphing, a grid line is automatically placed above each pen's band.

Plotting a value across the full width of the chart

Use horizontal lines to provide a frame of reference for your tag data. For example, if you define values that are the limits within which a tag must operate, and display horizontal lines in your trend to indicate the limits, when a tag crosses one of these limits the tag's alarm condition is obvious on the trend.

There are two ways to plot a value across the full width of the chart:

- In the Connections tab, assign a constant value to a pen.

When values for the pen have been plotted across the full width of the chart, the pen appears as a solid line.

- In the Connections tab, assign to a pen the tag, expression, or constant whose value will be used to determine the position of the line, and then in the Pens tab, choose the pen type Full Width.

  As soon as the trend is displayed, the pen appears as a horizontal line across the full width of the chart. Its vertical position is determined by the tag, expression, or constant's value. If the value changes, the position changes.

Choosing trend colors, fonts, lines, and markers

The following table summarizes where in the Trend Object Properties dialog box to specify colors, fonts, lines, and markers for a trend.

You can also specify these settings in the Properties tab of the Property Panel.

To specify this	Use this box or column	In this tab
Chart background color	Background color	Display
Horizontal label color	Text color	Display
Text font, style, and size	Font (button)	Display
Pen line, pen marker, pen icon, and vertical label color	Color	Pens
Pen line width	Width	Pens
Pen line style	Style	Pens
Pen marker	Marker	Pens
Vertical grid line color	Grid color	X-Axis
Horizontal grid line color	Grid color	Y-Axis

The trend border color

The trend border uses the highlight color for the graphic display, specified in the Behavior tab of the Display Settings dialog box.

The trend window color

By default, the trend window uses the background color of the display, specified in the General tab of the Display Settings dialog box.

To use a different window color

- In the Property Panel, select the opaque WindowStyle, and then specify the WindowColor property.

For information about using the Property Panel, see page 20-29.

Testing the trend

Test Display tool

You can quickly test the trend by switching to test mode. If communications are active and there is data for the tags, the pens plot values in the trend. When you are finished testing, switch back to edit mode to continue editing.

Edit Display tool

To switch between test and edit modes

- On the View menu, click Test Display or Edit Display, or click the Test Display and Edit Display tools.

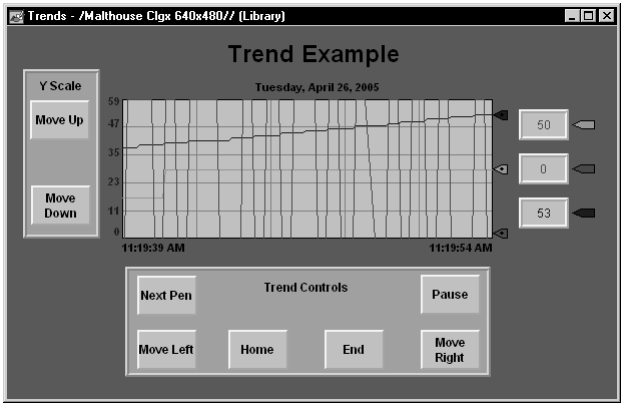
Test mode is not the same as running the display. Test mode does not change the appearance or position of the display as set up in the Display Settings dialog box. Also, data logging is not turned on in test mode.

Using the Trends graphic library

The Trends graphic library contains a trend graphic object and buttons for controlling the trend. It also contains numeric display objects that display the value of each tag used in the trend.

You can use the trend and objects as they are, or you can edit them to suit your needs. To use the objects, drag and drop (or copy and paste) them into your graphic display.

For information about copying and pasting objects from the graphic libraries, see page 20-41.



To use the Trends graphic library

1. Open the Graphics folder, and then open the Libraries folder.
2. Double-click the Trends library.
3. Drag and drop or copy and paste objects into your display.

Using buttons to control the trend at run time

You can use button graphic objects with the trend, to allow the operator to pause the trend, switch between pens, or scroll the trend. You can link buttons to a specific trend object, or set up a button to work with whichever object is selected in the graphic display. For information about linking buttons to objects, see page 21-9.

Use these buttons with trends:

This button	Does this
Pause	Toggles between pausing and automatic scrolling. When the trend is paused, the pen icons continue to move vertically to indicate the pens' current values. When the trend resumes scrolling, values that occurred while the trend was paused are filled in, bringing the trend up to the current time (unless you are scrolling historical data).
Next pen	Changes the vertical axis labels to the scale for the next pen. The color of the labels matches the color of the selected pen.
Move up	Scrolls up to display higher values on the vertical scale. For example, if the visible scale range is 0 to 100, pressing move up could change the visible range to 10 to 110. The incremental amount the axis scrolls depends on the pen's range and the number of horizontal grid lines. This button does not work if the "Minimum / maximum value option" in the Y-Axis tab is set to Automatic.
Move down	Scrolls down to display lower values on the vertical scale. This button does not work if the "Minimum /maximum value option" in the Y-Axis tab is set to Automatic.
Move left	Pauses the trend and scrolls to the left.
Move right	Pauses the trend and scrolls to the right.
Home	Pauses the trend and moves to the earliest data in the trend.
End	Resumes trend scrolling and moves to the current (latest) data in the trend.

To see how the buttons work with the trend, open the Trends graphic library (see page 28-10), and start test mode.

For information about creating buttons, see Chapter 20. For details about setting up the buttons, see page 21-16.

Printing trend data

To print trend data at run time, provide the operator with a method for printing the graphic display.

You can use these methods to print graphic displays at run time:

- Create a display print button. For information about creating graphic objects, see Chapter 20.
- Assign a tag or expression to the Remote Display Print connection (in the Global Connections editor). When the value of the tag or expression changes from 0 to a non-zero value, the current display is automatically printed.

  Program the data source to trigger the change as often as you want the data printed.

  For more information about setting up remote display printing, see Chapter 8.

Everything on the screen is printed, including the current display, pop-up windows, and any visible background applications.

For information about specifying which printer to use at run time for applications that will run on a personal computer, see page 15-10.

For information about specifying printer options for applications that will run on a PanelView™ Plus 6, PanelView™ Plus or PanelView Plus CE terminal, see the *PanelView Plus Terminals User Manual*.

Improving clarity of the trend printout

Depending on what type of printer you use, pen lines with a width of 1 pixel might not appear in the printout. Choose high-contrast colors and wider line widths to ensure that the trend data prints clearly.

Run-time errors for the trend

If data for the trend is not available at run time due to communication errors, a message is sent to FactoryTalk® Diagnostics.

See Help for information about solving common trend problems.

29 Setting up RecipePlus

This chapter describes:

- what recipes are.
- summary of steps for creating a recipe system.
- how the recipe system works.
- specifying the run-time location of recipe files.
- creating recipe files.
- comparing recipes.
- creating RecipePlus buttons, selectors, and tables.
- testing RecipePlus objects.
- using objects from the RecipePlus_Components graphic library.
- using buttons with the recipe objects.
- viewing data values that are saved at run time.

About recipes

A recipe is a set of numeric and string data values (ingredients) that can be downloaded to their associated tags at the data source. Each ingredient has a pre-set data value assigned to it. The set of data values for all the ingredients in a recipe is called a data set. The set of numeric and string tags assigned to the ingredients in the recipe is called a tag set. The ingredients, data sets, and tag sets are stored together in a recipe file.

You can create different pairs of data sets and tag sets for the same set of ingredients. Each pairing of data set with tag set is called a unit. Each unit is like a unique recipe. At run time, the operator can select the unit (recipe) that applies to the current operation.

For example, a bakery making whole wheat bread could use the same ingredients and tag sets, but depending on the type of crust desired, could use different data sets to specify different baking temperatures. As another example, you might want to have multiple production lines baking the same bread. In this case, the data set for all the production lines would be the same, but the tags receiving the recipe information would be different for each production line. Units allow you to combine different tag sets and data sets for the same set of ingredients.

The FactoryTalk® View RecipePlus system allows you to create up to 15,000 ingredients, 500 data sets, 50 tag sets, and 2,500 units for each recipe file. You can create data sets at

development time, edit them at run time, and also create new data sets from tag values at run time. You can write the data set values to tags, or write tag values to data sets.

The RecipePlus system can be used for manufacturing food and beverages, but it can also be used for any application where you want to display, edit, download, or save multiple values at once. For example, recipes are used in the petrochemical and pharmaceutical industries. In the pharmaceutical industry, you could use recipes to design flexible packaging, creating recipes that specify the number of tissues to put in a box or the number of milliliters of shampoo to put in a bottle.

Summary of steps

These are the steps for creating a recipe system:

1. In the RecipePlus Setup editor, specify the run-time location for recipe files. The files can be stored with the application or in a separate location. For details, see page 29-5.
2. In the RecipePlus Editor, set up ingredients, data sets, tag sets, and units. You can also specify a percent complete tag and a status tag for the recipe. For details, see page 29-6.
3. Create a display in the Graphics editor, containing a RecipePlus selector, table, and buttons. For details, see page 29-10.
4. If desired, create key buttons in the same graphic display, to allow the operator to use the selector and table without a keyboard.

   For information about the buttons you can use with recipes, see page 29-12.

How the recipe system works

A recipe system consists of a recipe file and the graphic objects used to work with the ingredients at run time.

RecipePlus selector

Use the RecipePlus selector to select the recipe file and unit to work with.

RecipePlus table

Use the RecipePlus table to display the selected recipe file's ingredients, tag values, and data set values. The operator can edit data set values in the table, unless you select the View only option.

If desired, you can include a Compare column in the table, to compare tag values to data sets at a glance. If you choose this option, FactoryTalk View displays an X in the Compare column when the tag value and data set value for an ingredient differ. Ingredients with an X are listed first.

RecipePlus button

Use the RecipePlus button to perform actions on the selected recipe's ingredients. The recipe is selected using the RecipePlus selector object. Set up a separate RecipePlus button for each action you want to perform:

- Download—write the data set values to tags, for all the ingredients in the selected recipe.
- Upload—write tag values to the data set, for all the ingredients in the selected recipe. If all values are uploaded successfully, the recipe file is saved.
- Upload and Create—write tag values for all the ingredients in the selected recipe to a new data set, creating a new unit. The operator is prompted for a name for the new unit. If all values are uploaded successfully, the recipe file is saved.

  The new data set is named Data Set *n*, where *n* is the next available number (starting at 1) that will create a unique data set name.
- Restore—display the selected recipe in the RecipePlus table.
- Save—save the data set values for the recipe file and unit displayed in the RecipePlus table. If the operator made changes in the data set values using the string pop-up keyboard or numeric pop-up keypad, the new values in the table overwrite existing data set values (if any) for the unit in the recipe file.
- Delete—delete the recipe unit selected in the RecipePlus selector object.
- Rename—rename the recipe unit selected in the RecipePlus selector object.

The illustration below shows a graphic library display that contains a RecipePlus selector, RecipePlus buttons, and a RecipePlus table. The display also contains key buttons for working with the selector and table, a bar graph that shows the percentage complete of the recipe operation, and a string display that shows the status of the recipe operation.

Number format

The values in the recipe table are displayed using the number format of the current application language. For example, if the application language uses a comma for the decimal symbol, floating-point values in the table use commas for the decimal symbol. For information about using multiple languages, see Chapter 12.

Numeric limits

RecipePlus supports the range of numbers allowed by the VARIANT data type. This range is -1.797693E+308 to 1.797693E+308. This range applies to the numbers that you enter in the RecipePlus Editor, and it also applies to the tag values that are uploaded to the recipe file at run time.

Specifying the run-time file location

Use the RecipePlus Setup editor to specify the run-time file location.

Storing files outside the HMI project

If you store the recipe files outside the HMI project, the run-time application can use updated recipe files without creating a new run-time application (.mer) file.

Storing recipe files outside the HMI project also allows you to use FactoryTalk View Studio to view and edit recipe data that is saved at run time without converting the .mer file to an .med file. For more information, see page 29-13.

If you want to store recipe files outside of the HMI project at run time, make sure you move the files from the application's RecipePlus folder to the specified run-time location before running the application.

This is the path to the RecipePlus folder:

\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME\HMI projects*Project name*\RecipePlus (Windows XP or Windows Server 2003 R2)

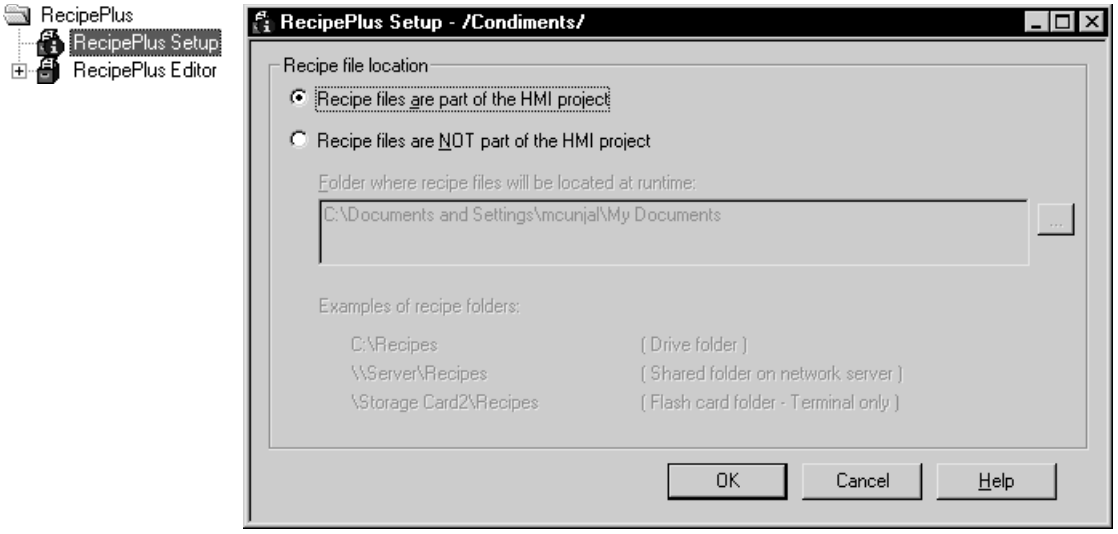
or

\Users\Public\Public Documents\RSView Enterprise\ME\HMI projects*Project name*\RecipePlus (Windows Vista,Windows 7 Professional or Windows Server 2008)

If recipe files are stored outside the HMI project, when you perform an action on a recipe file at run time, the file is locked until the action is completed. This prevents other users from making changes to a file while you are working with it.

Storing recipe files with the HMI project

If recipe files are part of the HMI project, when a recipe file is saved at run time, FactoryTalk View updates the .mer file with changes to the data sets. When you stop the run-time application, the changes are retained, and are displayed the next time you run the application and display the recipe file. You can convert the .mer file to an .med file to view the changes in FactoryTalk View Studio. For more information about converting run-time application files, see page 14-7.


RecipePlus
RecipePlus Setup
RecipePlus Editor
RecipePlus Setup - /Condiments/
Recipe file location
Recipe files are part of the HMI project
Recipe files are NOT part of the HMI project
Folder where recipe files will be located at runtime:
C:\Documents and Settings\mcunjal\My Documents
Examples of recipe folders:
C:\Recipes (Drive folder)
\\Server\Recipes (Shared folder on network server)
\Storage Card2\Recipes (Flash card folder - Terminal only)
OK
Cancel
Help

For details about using the RecipePlus Setup editor, see Help.

Setting up recipe files

Use the RecipePlus Editor to set up one or more recipe files. Each file is stored in the editor's folder. You can open and work on multiple recipe files at the same time.

The RecipePlus Editor has special items on the Edit menu that allow you to easily copy and paste from the spreadsheet in the Ingredients tab to Microsoft® Excel. This editor also has items on the Recipe menu, for adding, deleting, and renaming data sets and tag sets, and for comparing recipes.

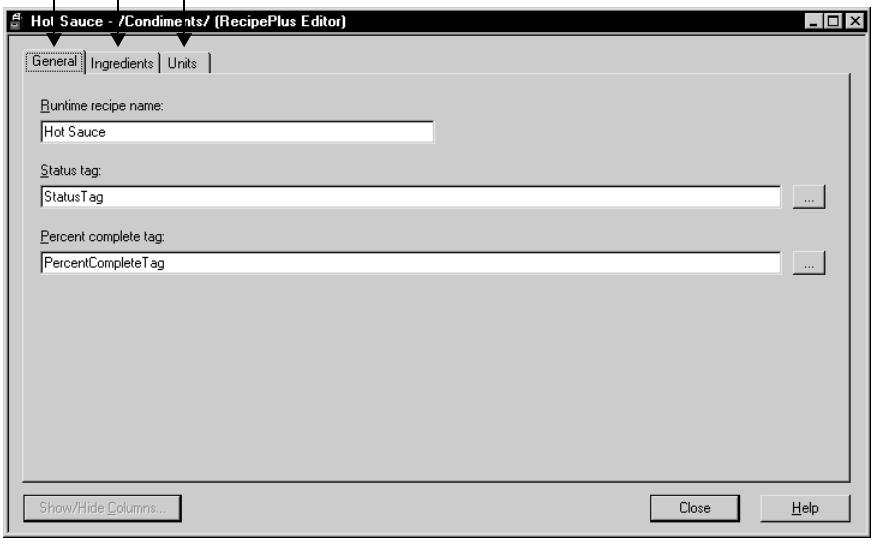
To help you get started, FactoryTalk View creates one data set, tag set, and unit. You can rename them and assign data values and tags to them, or delete them and create your own.

For information about comparing recipes, see the next section.

Specify the run-time name, status tag, and percent complete tag.

Set up ingredients, minimum and maximum values, data sets, and tag sets.

Set up units (pairs of data sets and tag sets).



For details about the options in the RecipePlus Editor, see Help.

You can also use the RecipePlus Editor to view the data values that are saved at run time. For more information, see page 29-13.

Comparing recipes

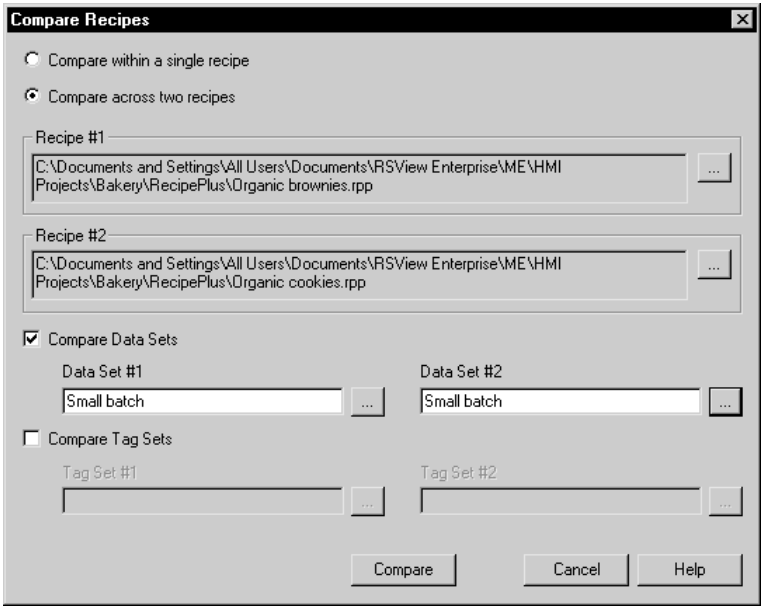
You can use the RecipePlus Editor to compare data sets and tags sets within a single recipe, or between two recipes.

If you are comparing data sets or tag sets within a recipe, only ingredients with different values are displayed in the report.

If you are comparing data sets or tag sets between two recipes, both common ingredients and unique ingredients are listed in the report.

To compare recipes

1. Open the RecipePlus Editor.
2. On the Recipe menu, click Compare Recipes.

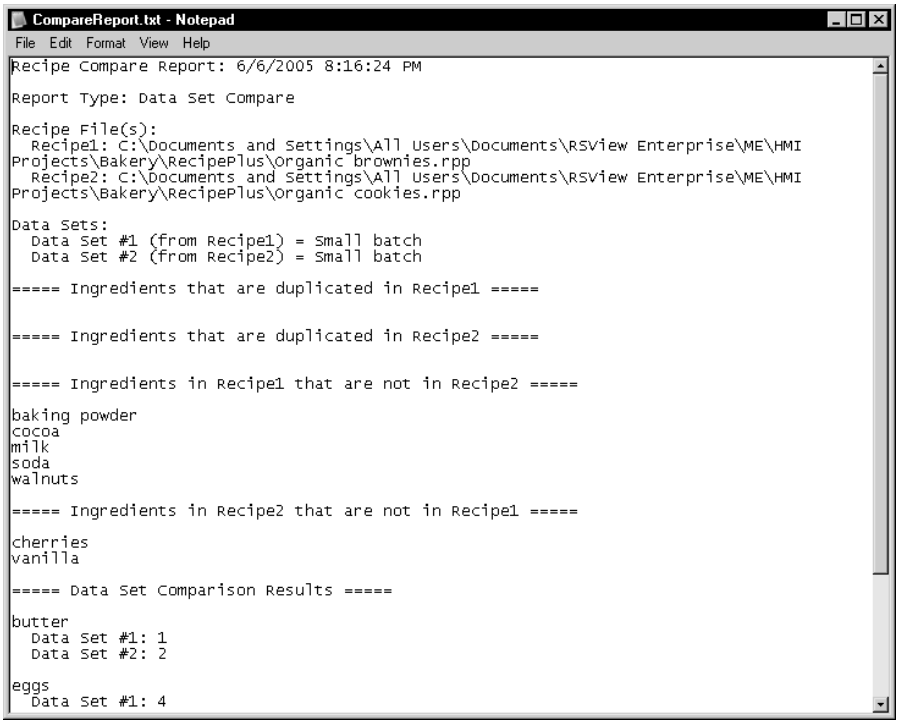


3. Specify the recipe file or files, data sets, and tag sets to compare.

   For information about the options in the Compare Recipes dialog box, see Help.

4. Click Compare.

   A report is displayed in Windows® Notepad.


CompareReport.txt - Notepad
File Edit Format View Help
Recipe Compare Report: 6/6/2005 8:16:24 PM
Report Type: Data Set Compare
Recipe File(s):
Recipe1: C:\Documents and Settings\All Users\Documents\RSView Enterprise\ME\HMI Projects\Bakery\RecipePlus\Organic brownies.rpp
Recipe2: C:\Documents and Settings\All Users\Documents\RSView Enterprise\ME\HMI Projects\Bakery\RecipePlus\Organic cookies.rpp
Data Sets:
Data Set #1 (from Recipe1) = Small batch
Data Set #2 (from Recipe2) = Small batch
===== Ingredients that are duplicated in Recipe1 =====
===== Ingredients that are duplicated in Recipe2 =====
===== Ingredients in Recipe1 that are not in Recipe2 =====
baking powder
cocoa
milk
soda
walnuts
===== Ingredients in Recipe2 that are not in Recipe1 =====
cherries
vanilla
===== Data Set Comparison Results =====
butter
Data Set #1: 1
Data Set #2: 2
eggs
Data Set #1: 4

Time and date formats

The time and date in the report use the time and short date format for the current application language. For information about using multiple languages, see Chapter 12.

Printing recipes

You can use the RecipePlus Editor to print recipe data sets. For information about printing from editors, see page 2-13.

Creating RecipePlus objects

You can create one RecipePlus table and RecipePlus selector per graphic display. You can create multiple RecipePlus buttons in a display, with a different action assigned to each.

The objects and button actions to use depend on how you want to use your recipe system. For example, if you just want to write data set values to tags, all you need is a RecipePlus selector and a RecipePlus button with the download action. For information about how the different objects in the recipe system work, see page 29-2.

To create a recipe object

1. In the Graphics editor, create or open a graphic display.
2. Select a RecipePlus drawing tool by doing one of the following:
   - In the Objects toolbox, click the RecipePlus Button, RecipePlus Selector, or RecipePlus Table tool.
   - On the Objects menu, select RecipePlus, and then click RecipePlus Button, RecipePlus Selector, or RecipePlus Table.
3. Drag the mouse to create a box approximately the size you want for the object.
4. Double-click the object to open its Properties dialog box.
5. Set up the object. For details, see Help.

Once you have set up a RecipePlus object, you can edit it as you would any other graphic object. You can move it, resize it, attach animation to it, and so on. You can also use the object in other graphic displays by dragging it from one display and dropping it into another.

For more information about graphic objects, see Chapter 20.

Testing RecipePlus objects

Test Display tool

Edit Display tool

You can quickly test the recipe objects in a display by switching to test mode. If communications are active and there is data for the tags, you can download and upload recipe tag values. When you are finished testing, switch back to edit mode to continue editing.

To switch between test and edit modes

- On the View menu, click Test Display or Edit Display, or click the Test Display and Edit Display tools.

Test mode is not the same as running the display. Test mode does not change the appearance or position of the display as set up in the Display Settings dialog box.

Using the RecipePlus_Components graphic library

The RecipePlus_Components graphic library contains a RecipePlus selector and table and buttons for working with the objects. It also contains a bar graph and multistate indicator that display the status of recipe operations.

Use test mode to see how the different RecipePlus objects work together. In test mode, the RecipePlus selector in the library displays any recipe files and units that you have created in your application.

You can use the objects in the library as they are, or you can edit them to suit your needs. To use the objects, drag and drop (or copy and paste) them into your graphic display. For information about copying and pasting objects from the graphic libraries, see page 20-41.

To use the RecipePlus_Components graphic library

1. Open the Graphics folder, and then open the Libraries folder.
2. Double-click the RecipePlus_Components library.
3. Drag and drop or copy and paste objects into your display.

Using buttons with recipe objects

You can use button graphic objects with the RecipePlus selector and table, to select the recipe and unit to work with, and to select ingredients in the table.

You can link buttons to a specific recipe object, or set up a button to work with whichever object is selected in the graphic display. For information about linking buttons to objects, see page 21-9.

Use these buttons with recipe objects:

This button	Does this
Move up	Moves the highlight bar up one item in the list.
Move down	Moves the highlight bar down one item in the list.
Page up	Moves the highlight bar up one page in the list.
Page down	Moves the highlight bar down one page in the list.
Home	Moves the highlight bar to the top item in the list.
End	Moves the highlight bar to the bottom item in the list.
Enter (table only)	Opens the numeric keypad or string keyboard for the operator to edit the data set value. If a numeric ingredient has a minimum and maximum value defined, these values are displayed in the numeric keypad. If the table is defined as View only, the operator cannot edit it.

To see how the buttons work with the RecipePlus selector and table, open the RecipePlus_Components graphic library (see page 29-11), and start test mode.

For information about creating buttons, see Chapter 20. For details about setting up the buttons, see page 21-16.

Example: Editing and downloading recipe values at run time

This example shows how to use the RecipePlus graphic objects to edit and download recipe values at run time.

1. In the RecipePlus editor, create a RecipePlus file containing ingredients, several data sets, a tag set, and several units combining the different data sets with the tag set.
2. Open the RecipePlus_Components library.
3. Start test mode.

4. Use the move up and move down buttons next to the RecipePlus selector to highlight a unit in the selector, and then press the Restore button.

   The unit's ingredients are displayed in the RecipePlus table, with the data set values in the Recipe column.

5. Use the move up and move down buttons next to the RecipePlus table to select an ingredient, and then press the Enter button.

   The numeric pop-up keypad opens, displaying the minimum and maximum values for the ingredient. If the ingredient is a string ingredient, the string pop-up keyboard opens.

6. Type a new value for the ingredient, and then press Enter.

   The new value is displayed in the Recipe column.

7. Press the Save button to save the new value.

8. Press the Download button to write all the values in the Recipe column to the tags associated with the ingredients.

   The values are downloaded to the data source.

Viewing data values that are saved at run time

Use the RecipePlus Editor in FactoryTalk View Studio to view data values that have been saved at run time.

The operator can save tag values at run time by uploading to an existing data set or to a new data set. The operator can also edit data set values in the RecipePlus table and save the edited values (unless the table is View only).

If recipe files are stored with the HMI project, changes are saved in the .mer file. To view the changes in FactoryTalk View Studio, convert the .mer file to an .med file. For more information about converting the run-time application file, see page 14-7.

To view data values in modified recipe files

1. If recipe files are stored outside of the HMI project, do one of the following:

   - Add the recipe file (*.rpp) that you saved at run time into the application using Add Component Into Application (for details, see page 18-3).
   - If the recipe file already exists in the application, you can just copy the modified file back into the application's RecipePlus folder. (For the path to the RecipePlus folder, see page 29-5.)

2. If recipe files are stored with the HMI project, and you have not already done so, convert the run-time application file to a development application, as described on page 14-7.
3. In the Explorer window in FactoryTalk View Studio, double-click the modified recipe file.

   The RecipePlus Editor opens.
4. Click the Ingredients tab.
5. If the data set you want to view is not visible, scroll right to see more data sets.

30 Using macros

This chapter describes:

- using macros to assign values to tags.
- using the Macros editor.
- when to use macros.
- running macros when tags or expressions change value.
- where to assign macros.

Using macros to assign values to tags

A macro is a list of tag assignments stored in a text file, in the format <tag>=<value>. Each assignment assigns a value to a tag. The value can be in the form of another tag, an expression, a numeric constant, or a string.

Examples: Using macros to set tag values

Tag1 = 8
Sets the value of Tag1 to 8.

Tank1\Message = “Tank1 overflow”
Sets the string tag Tank1\Message to Tank1 overflow.

Tag1 = Tag2
Sets the value of Tag1 to be the same as Tag2.

Tag1 = Tag1 + 1
Increases the value of Tag1 by 1.

Tag1 = if (Tag2 < Tag1) then 4 else 3
Performs the if-then-else calculation and stores the result in Tag1.

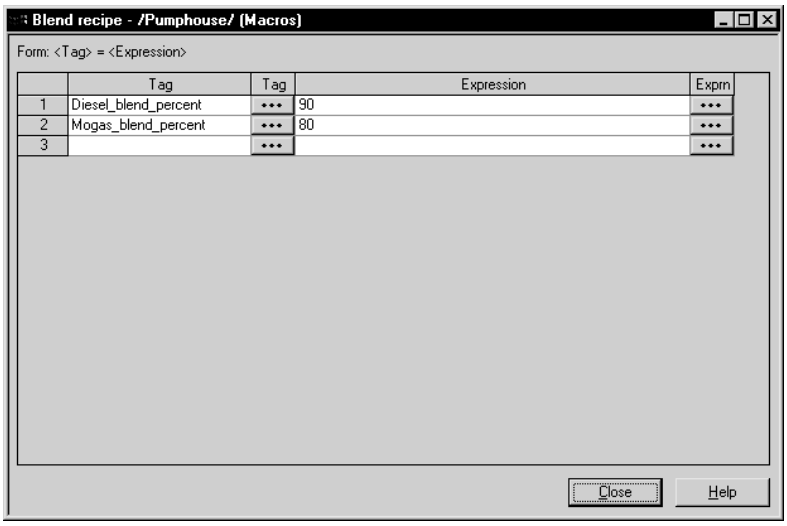
1Pump = {Industry-2} + {2Pump}
Adds the values of Industry-2 and 2Pump and stores the result in 1Pump.

Brackets surround Industry-2 because of the dash in the name. Brackets surround 2Pump because the name starts with a number. No brackets are used for 1Pump because this name is on the left side of the equal sign.

For more information about expression syntax, see Chapter 23.

Using the Macros editor

Use the Macros editor to create macros.



For details about using the Macros editor, see Help.

When to use macros

You can assign macros to run when:

- the application starts or shuts down.
- a graphic display opens or closes.
- a user logs in or out. Macros can be assigned to individual users and to groups of users.
- a specified tag or expression changes to a new non-zero value (using global connections).
- an operator presses a macro button.

At run time, when the macro runs, the values are sent to the tags at the data source.

At run time, the tag assignments are executed asynchronously. That is, the system does not wait for the completion of one tag assignment before executing the next. Therefore, do not rely on the order of assignments to control your process.

Running macros when tags or expressions change value

You can use global connections to run macros when tags or expressions change value. This means you can use the data source to trigger the macro to run.

FactoryTalk® View allows you to create up to five macros for use with global connections. The macros must be named Macro1, Macro2, Macro3, Macro4, and Macro5 in order to work with global connections.

For more information about global connections, see Chapter 8.

Example: Using macros to reset tag values

This example shows you how to run a macro whenever the operator needs to reset production information tags to known values.

The macro writes the desired values to the tags whenever the operator presses a momentary push button.

1. Create a memory tag called ResetProdData.
2. Create a momentary push button with the caption “Reset Production Data.” Assign the ResetProdData tag to the Value connection.
3. Create a macro called Macro1, with these tag assignments:

   TotalProductionUnits=0
   LineDownTime=0
   TotalRejects=0

4. In the Global Connections editor, assign the ResetProdData tag to the Remote Macro1 connection.

When the operator presses the Reset Production Data button, the value of the ResetProdData tag changes from 0 to 1. This tells FactoryTalk View to run Macro1, which writes the specified values to the tags in the macro.

Where to assign macros

Once you've created the macros you want to use, assign the macros in these editors:

In this editor	Do this
Startup	Assign application startup and shutdown macros.
Graphics	Assign macros to run when displays open or close, using the Display Settings dialog box.
Runtime Security	Assign macros to run when users log in and log out. Macros that you assign to groups of users run each time any member of the group logs in or logs out.
Global Connections	Specify the tags or expressions that will run the macros named Macro1 to Macro5.

APPENDIX A

Converting PanelBuilder 1400e applications

This appendix describes:

- terms that are different in PanelBuilder™ 1400e and FactoryTalk® View.
- steps for converting PanelBuilder 1400e applications.
- names of equivalent graphic objects in the two products.
- PanelBuilder 1400e graphic objects that are not supported in FactoryTalk View.
- PanelBuilder 1400e settings and controls that are not supported in FactoryTalk View.
- how communications are converted and which PanelBuilder 1400e communication protocols are not supported in FactoryTalk View.
- converting PanelBuilder 1400e Remote I/O communications.
- PanelBuilder 1400e graphic object features that are not supported in FactoryTalk View, with information about how to achieve the same result when possible.
- converting PanelBuilder 1400e expressions.

PanelBuilder 1400e applications are applications you create using PanelBuilder 1400e Configuration Software for Windows®. For information about converting applications from PanelBuilder or PanelBuilder32, see Appendix B.

You can convert PanelView 1200 applications to PanelBuilder 1400e applications, and then convert the PanelBuilder 1400e applications to FactoryTalk View Machine Edition applications.

Terminology

These terms are different in PanelBuilder 1400e and FactoryTalk View.

PanelBuilder 1400e term	FactoryTalk View term
screen	display, graphic display
Optional Keypad Write Expression	Optional Expression
programmable controller	data source
control	connection

In FactoryTalk View, the data source can be memory or a device such as a programmable controller or an OPC® server. FactoryTalk View writes values to and reads values from the data source. The data source is configured to exchange information (in the form of numeric or string values) between FactoryTalk View and the machine that your application is controlling. The general term data source is used unless specifically discussing a programmable controller.

Summary of steps

Follow these steps to convert PanelBuilder 1400e applications:

1. Prepare the application in PanelBuilder 1400e, and then convert the application file, as described in the next section.
2. Specify additional project settings, as described on page 4-11.

   For example, if you want the application to have a border around its graphic displays, or to use a title bar, you can specify these options in the Project Settings editor.

   We recommend that you use the Project Settings editor to change the project window size, rather than using the Convert to new window size option in the Machine Edition Import Wizard.

3. If you use the Convert to new window size option in the Machine Edition Import Wizard, check the position of the graphic objects in each display.
4. Set up communications and edit tags that don't convert directly.

   For more information, see page A-9.

5. Set up graphic object features that don't convert directly.

   For more information, see page A-12.

6. Check each expression you used in PanelBuilder 1400e.

   For more information, see page A-13.

7. If you are going to use a printer at run time, set it up for Ethernet® or USB printing. Adjust the printer settings on the PanelView™ Plus or PanelView™ Plus CE terminal.

   For information about setting up printers on the terminal, see the *PanelView Plus Terminals User Manual*.

Converting PanelBuilder 1400e application files

Follow these steps to convert a PanelBuilder 1400e application file, with the extension .pvc, to an FactoryTalk View application file, with the extension .med. The original PanelBuilder 1400e application file is not modified by the conversion.

For information about converting RIO applications, see page A-10.

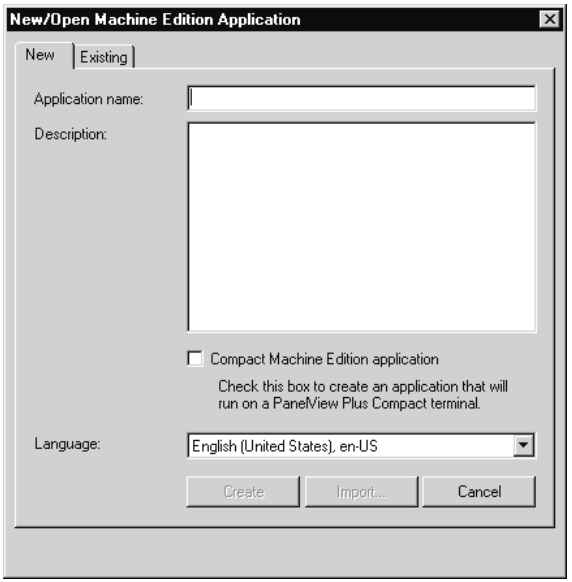
Steps to take in PanelBuilder 1400e before you convert the application

1. Delete the Pass-Through file assignment. FactoryTalk View Studio does not support pass-through file transfers.
2. Make sure the block transfer file numbers are sequential without gaps. If necessary, renumber the block transfer file numbers so there are no missing numbers. Tag addresses in the application will change automatically to match the new number.
3. Save the application.

You can convert the PanelBuilder 1400e application when you open FactoryTalk View Studio, or once FactoryTalk View Studio is already open.

To convert a PanelBuilder 1400e application when you open FactoryTalk View Studio

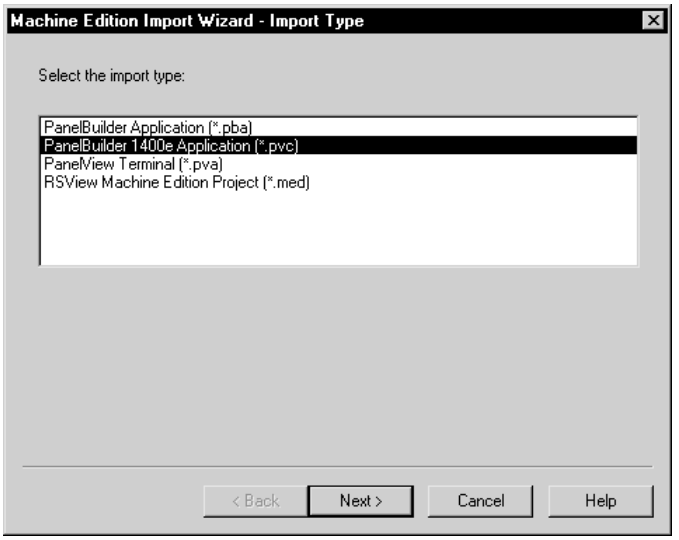
1. Open FactoryTalk View Studio.



2. In the New tab, in the Application name box, type a name for your converted application, up to 32 characters long.
3. If desired, type a description of the application.

If the PanelBuilder 1400e application contains an Application File Comment, the Application File Comment will overwrite the description you type here. You can add or change the description later, as described on page 4-18.

4. If the application is intended to run as a Compact Machine Edition application, check this box. If the application exceeds the limits for Compact applications, the application will be created as a regular, non-Compact application.
5. Specify a language for the converted application. For information about using different languages, see Chapter 12.
6. Click Import.



7. Follow the steps in the Machine Edition Import Wizard.

   For details about the options in the Machine Edition Import Wizard, see Help.

When you complete the steps of the wizard, FactoryTalk View Studio converts the PanelBuilder 1400e application, creates the converted application's folders and files, and then displays the converted application in the Explorer window in FactoryTalk View Studio.

If there are any messages about conversion, they are displayed automatically in the Project Status dialog box.

The converted application is created in the ME\HMI projects directory, in a folder with the same name as the application name you specified in step 2.

This is the path to the ME\HMI projects directory:

\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME\HMI projects (Windows XP or Windows Server 2003 R2)

or

\Users\Public\Public Documents\RSView Enterprise\ME\HMI projects (Windows Vista,Windows 7 Professional or Windows Server 2008)

Conversion messages are saved in a file called Convert.log, in the HMI projects directory.

To convert a PanelBuilder 1400e application when FactoryTalk View Studio is already open

New Application

1. On the File menu, click New Application, or click the New Application tool.

   If an application is already open, FactoryTalk View Studio asks you whether to close the application that is currently open. Click Yes.

2. Follow steps 2 through 7 in the previous procedure.

Equivalent graphic objects

This section describes graphic objects that are equivalent in PanelBuilder 1400e and FactoryTalk View, but have different names in the two products.

This PanelBuilder 1400e object	Is converted to this FactoryTalk View object	Notes
Increment Value Button	Ramp button	During conversion the button is set up to increment.
Decrement Value Button	Ramp button	During conversion the button is set up to decrement.
Increment Value Button with Display	Ramp button and numeric display	The Increment Value Button with Display is divided into two separate FactoryTalk View objects.
Decrement Value Button with Display	Ramp button and numeric display	The Decrement Value Button with Display is divided into two separate FactoryTalk View objects.
ASCII Input (small and large)	String input enable button	
Numeric Entry Keypad (small and large)	Numeric input enable button	
Screen List Selector's list	Display list selector	The PanelBuilder 1400e Screen List Selector is divided into four separate FactoryTalk View graphic objects.
Screen List Selector's Enter Key	Enter button	

This PanelBuilder 1400e object	Is converted to this FactoryTalk View object	Notes
Screen List Selector's Down Cursor	Move down button	
Screen List Selector's Up Cursor	Move up button	
Control List Selector's list	Control list selector	The PanelBuilder 1400e Control List Selector is divided into four separate FactoryTalk View graphic objects.
Control List Selector's Enter Key	Enter button	
Control List Selector's Down Cursor	Move down button	
Control List Selector's Up Cursor	Move up button	
Screen Select Keypad (small and large)	Display list selector	Specify the graphic displays that the display list selector can open.
Screen Keypad Enable Button	Display list selector	Specify the graphic displays that the display list selector can open.
Goto Screen Button	Goto display button	
Return to Previous Screen Button	Return to display button	
ASCII Display	String display	
Numeric Keypad Enable Button	Numeric input enable button	
Normally Open Momentary Push Button	Momentary push button	During conversion the button is set up to be normally open.
Normally Closed Momentary Push Button	Momentary push button	During conversion the button is set up to be normally closed.
Screen Print Button	Display print button	
Alarm History Sort By Time/Sort By Value Button	Sort alarms button	
Alarm Status Reset Qty/Time Button	Reset alarm status button	
Alarm Panel	Alarm banner	
Single Line Alarm Window	Alarm banner	

This PanelBuilder 1400e object	Is converted to this FactoryTalk View object	Notes
Alarm Status Screen	Alarm status list	
Clear All Button	Clear alarm history button	
Print Button (in Alarm History screen)	Print alarm history button	
Print Button (in Alarm Status screen)	Print alarm status button	
Alarm Status Button/Alarm History Button	Goto display button	
Exit Button	Close display button	
Alarm History List	Alarm list	
Display Mode Button	Alarm status mode button	
Time Display	Time and date display	During conversion the display is set up to show the time only. The PanelBuilder 1400e time format is not converted. For details about the FactoryTalk View time format, see page 21-15.
Date Display	Time and date display	During conversion the display is set up to show the date only. The PanelBuilder 1400e date format is not converted. For details about the FactoryTalk View date format, see page 21-15.
Arc (with solid fill style)	Arc (with solid back style) and line	The line graphic object is added because the solid FactoryTalk View arc shape does not have a line between the two points of the arc. FactoryTalk View arc FactoryTalk View arc with line

Unsupported graphic objects

These PanelBuilder 1400e objects are not supported in FactoryTalk View:

- Scrolling List (includes Cursor List, Multistate Indicator Object List, Local Message Object List, Numeric Data Display Object List)
- Set Bit Cursor Point

Unsupported settings and controls

This section describes PanelBuilder 1400e settings and controls that are not used in FactoryTalk View.

Controls for transferring run-time application files

PanelBuilder 1400e uses these optional controls for transferring files to the run-time terminal:

- Transfer Inhibit control
- Transfer Request control
- Transfer Status control

These controls are not necessary in FactoryTalk View because the ME Transfer Utility allows you to transfer the run-time project file while running a project on the run-time terminal.

Settings and controls for alarms

FactoryTalk View does not use these PanelBuilder 1400e features and settings to manage alarms:

- alarm relays
- bit alarm acknowledgement
- Remote Alarm Operation Hold Time. The PanelBuilder 1400e Remote Alarm Ack Control Hold Time will be used for all alarm hold times. You can change the hold time in the FactoryTalk View Alarm Setup editor, in the Advanced tab.
- Remote Alarm Control Delay Time. In FactoryTalk View, if an Ack connection is assigned, when an alarm is acknowledged the Ack connection is set immediately, without waiting for a delay time.

FactoryTalk View does not use these PanelBuilder 1400e controls to manage alarms:

- PLC Controlled Relay control
- PLC Controlled Audio control
- Acknowledge to PLC control (if the Alarm Acknowledge to PLC option is set to Bit)

Invalid characters in screen names

Characters in PanelBuilder 1400e screen names that are not supported in FactoryTalk View are replaced with the underscore character.

Screen security settings

PanelBuilder 1400e screen security settings are not converted, because FactoryTalk View uses a different method to assign security to graphic displays. For information about setting up security in FactoryTalk View, see Chapter 11.

Block tags

Block tags are not supported in FactoryTalk View. Block tags that are monitored for alarms in your PanelBuilder 1400e application are converted to bit arrays. For information about monitoring bit arrays for alarm conditions, see Chapter 9.

Converting non-RIO communications

This section describes how communications that do not use Remote I/O (RIO) are converted. For information about converting RIO communications, see page A-10.

FactoryTalk View does not use nodes for communications. Nodes are converted to RSLinx® topics. Topics are then converted into device shortcuts, to run with RSLinx® Enterprise™. You must have both RSLinx® Classic™ and RSLinx Enterprise installed to make this two-step conversion.

Tags are converted to HMI device tags and RSLinx aliases. The Unsolicited_Msgs node is not converted.

If you import an application multiple times, delete the device shortcuts in RSLinx Enterprise before re-importing. Otherwise, multiple unused device shortcuts will be created in RSLinx Enterprise.

For more information about setting up communications, see Chapter 5.

Unsupported tag data types

These tag data types are not supported in FactoryTalk View:

- Bit Position
- 1-BCD, 2-BCD, 5-BCD, 6-BCD, 7-BCD, 8-BCD
- BIN3, BIN4, BIN6, BIN8 (used with Modbus communications)

Tags that use these data types are converted to analog HMI tags with the Default data type. The Default data type uses floating point values.

For Bit Position data types, use the bitwise expression operators to display data that does not reference supported lengths. For more information, see the Rockwell Automation KnowledgeBase.

To open the KnowledgeBase

- In FactoryTalk View Studio, on the Help menu, select Rockwell Software on the Web, and then click Rockwell Automation KnowledgeBase.

For information about using bitwise expression operators, see page 23-8.

Unsupported initial values

Device tags in FactoryTalk View do not use initial values. Memory tags are converted with their initial values.

Converting RIO communications

You can use Remote I/O (RIO) communications on the PanelView Plus 6, PanelView Plus and PanelView Plus CE run-time platforms.

RIO communications are not supported for applications that will run on a personal computer. However, you can test run your RIO applications on the development computer.

To convert an RIO application from PanelBuilder 1400e to FactoryTalk View

1. Convert the application, as described on page A-2.
2. Open the RSLinx Enterprise data server, and then double-click Communication Setup.
3. In the Communication Setup editor, add an RIO driver.
   - For PanelView Plus 400 and 600 terminals, use the 2711P-RN1 driver.
   - For all other PanelView Plus or PanelView Plus CE terminals, use the 2711P-RN6 driver.

   For information about adding drivers in RSLinx, see RSLinx Help.
4. Expand the RIO tree, right-click RIO Data, and then click Configure RIO.
5. In the RIO Configuration dialog box, right-click RIO, and then click Import.
6. Browse to the location of the RIO configuration file.

   The file is saved in the root of the application's directory.
7. In the Communications Setup editor, create a device shortcut that points to the RIO data device.

For information about creating a device shortcut, see RSLinx Help.

8. Apply the shortcut to the RIO driver.
9. Correct any invalid RIO configurations. Invalid RIO configurations are highlighted with red “x” icons.

If red “x” icons appear after you import the RIO .xml file, you can fix block tags in the Communication Setup editor in FactoryTalk View. The length of block tags must be the same for Read and Write pairs sharing the same rack, group, and slot.

10. Create an alias for any data that is not a 16-bit integer or bit.
11. Save the converted RIO application.

RIO configurations are not saved with the application when you exit FactoryTalk View Studio. However, they are backed up with the application in the Application Manager. For information about handling multiple applications with different RIO settings, see the Rockwell Automation KnowledgeBase. For information about using the Application Manager, see page 4-10.

Unsupported PanelBuilder 1400e RIO tags

A PanelBuilder 1400e RIO tag will be converted to an HMI memory tag and an error will be logged to the conversion log file if the RIO tag:

- has a blank address.
- has a data type of 1-BCD, 2-BCD, 3-BCD, 5-BCD, 6-BCD, or 7-BCD.
- has a data type of Bit Position and its address does not reference a single bit.
- float has a data type of Float and its address has a bit offset assigned that is not 0.
- has a data type of Long Integer or 8 Digit BCD, its address has a bit offset assigned that is not 0, and its length or range is greater than (32 - *Start Bit*).
- has a tag type of Block.
- has an invalid PanelBuilder 1400e address or references an undefined rack.

Unsupported graphic object features

This section describes features of PanelBuilder 1400e graphic objects that are not supported in FactoryTalk View. The Notes column provides additional information and describes methods for achieving the same result when possible.

Graphic object	Unsupported feature in FactoryTalk View	Notes
Image, text, arc, ellipse, line, panel, rectangle, wedge	Blinking wallpaper objects	If you want an object to blink at run time, unlock the wallpaper. In FactoryTalk View, all of the listed objects except images and panels use color animation to blink. For details, see page 22-10. Panels use the Blink property to blink. Color images do not blink. Monochrome images use the Blink property to blink.
Numeric Display	Polarity	If a PanelBuilder 1400e application was set up with the Polarity control requiring a negative number to display the minus sign, the numeric display will not work properly after the application is converted to FactoryTalk View Machine Edition.
Numeric Input Cursor Point, Numeric Data Display	Fixed Position and PLC Controlled decimal display options	Use an expression to achieve the same result. Assign the expression to the object's Value connection. For information about expressions, see Chapter 23.
Numeric Input Cursor Point, Numeric Keypad Enable Button, Numeric Keypad	PLC Controlled and Decimal Key Controlled input options	Objects are converted with the Decimal Point property set to Implicit.
Numeric Input Cursor Point	Retain Cursor on Cancel	The numeric input cursor point retains focus when the operator cancels entering a numeric value.
Maintained Push Button, Multistate Push Button, Control List Selector	Initial state values	If you want to set these objects' states on application startup, create a macro to set the appropriate tag values for the objects' connections. For information about macros, see Chapter 30. Assign the macro in the Startup editor. For details, see Help.

Graphic object	Unsupported feature in FactoryTalk View	Notes
Trend	Blinking pens	
	Date labels on the X-Axis	The date is displayed in the title.
	Background screen plotting	You can plot tag values in the background by assigning the tags to a data log model. Tags set up for background screen plotting are automatically assigned to a data log model on conversion. However, data log models do not plot expression values. Therefore, expressions set up for background screen plotting are not converted. For information about data logging, see Chapter 26.
All objects	PanelBuilder 1400e object name	Object names are replaced with the FactoryTalk View default object names. The PanelBuilder 1400e object name is used for the object's description. You can view and edit the name and description in the Property Panel. For details, see Help.
All objects	Caption and image placement	FactoryTalk View supports one, three, or nine positions for captions and images, depending on the type of object. On conversion, captions and images are positioned using the closest match. Therefore some captions might overlap images, some captions might be truncated, and some images might be clipped to fit the object.
All objects	Multiple image labels	FactoryTalk View supports one image label per object or state. If a PanelBuilder 1400e object is set up to use multiple image labels, only the top left image is converted.

Converting expressions

Some PanelBuilder 1400e expression syntax is not supported in FactoryTalk View. Expressions are converted without modification, and then turned off by placing warning text at the beginning of the first line of the expression. In addition, exclamation marks (!) are placed at the beginning of each subsequent line of the expression. Warming text is also placed in expressions assigned to alarm triggers in the Alarm Setup editor. To turn on the expression, you must remove the warning text and exclamation marks, and revise the syntax if necessary.

The maximum expression length in FactoryTalk View is 16,000 characters. If a PanelBuilder 1400e expression contains more than 16,000 characters, the excess characters are not converted.

Some PanelBuilder 1400e objects support both tags and expressions. For these objects, if the text assigned to a connection could be valid syntax for both a tag and an expression, the connection is treated as an expression, and is therefore turned off.

For example, N20-0_String_64 could be the name of a tag, or it could be an expression that subtracts "0_String_64" from the tag "N20." The text would be converted as an expression, and turned off.

To turn on an expression

1. Select the object containing the expression.
2. Open the Property Panel, and then click the Connections tab.
3. In the Exprn column, click the Browse button beside the expression to turn on.

Browse button

4. In the Expression editor, delete the warning text and exclamation marks.
5. Revise the expression, if necessary, using the tables in the following three sections as guides.
6. Click Check Syntax.

For more information about using the Expression editor, see Chapter 23 or Help.

Equivalent expression syntax

This table describes FactoryTalk View expression syntax that is equivalent to PanelBuilder 1400e syntax. When you edit the converted expressions, replace the PanelBuilder 1400e syntax with the FactoryTalk View equivalent.

Syntax that is not listed in this table or in the next section is okay the way it is.

Type of expression component or operator	PanelBuilder 1400e syntax	FactoryTalk View syntax
Comment	REM or ‘	!
Line continuation	_ (underscore)	Not needed.
Equality	(=)	EQ or ==

Type of expression component or operator	PanelBuilder 1400e syntax	FactoryTalk View syntax
Bitwise Not	Not	~ (tilde)
Bitwise And	And	&
Bitwise Or	Or	| (pipe)
Bitwise XOr	XOr	^
If both operands are Byte, Integer, Long, Variant, or any combination of these data types, use the FactoryTalk View syntax. For other data types, no change is needed.		

Unsupported expression syntax

This table describes the PanelBuilder 1400e expression syntax that is not supported in FactoryTalk View with information about how to achieve the same result where possible.

Type of expression component or operator	PanelBuilder 1400e syntax	Equivalent FactoryTalk View syntax (if any)
Exit statement	Exit	
Local variables	DIM *varname* AS ... *varname* =	
Integer division	\	(*x* - (*x* MOD *y*))/*y*
Endif	If then endif If then else endif	If then else 0 If then else
Select case	Select Case Case1...CaseN CaseElse EndSelect	Use nested if-then-else.
Logical Xor (if one or both operands are Boolean or Single data types)	Xor	NOT ((*x* AND *y*) OR NOT (*x* OR *y*))

Order of precedence

The order of precedence is slightly different in FactoryTalk View. Check your expressions to make sure the result is what you intend.

PanelBuilder 1400e order of precedence	FactoryTalk View order of precedence
( )	( )
- (negation)	NOT, ~ (tilde)
*, / (floating point division)	*, /, MOD, %, **, AND, &&, &, >>, <<
\ (integer division)	+, -, OR, ||, |, ^
MOD	EQ, ==, NE, <>, LT, <, GT, >, LE, <=, GE, >=
+, - (subtraction)	
=, <>, <, >, <=, >=	
Not	
And	
Or	
Xor	

For more information about order of precedence, see page 23-10.

APPENDIX B

Converting PanelBuilder and PanelBuilder32 applications

This appendix describes:

- terms that are different in PanelBuilder™ and FactoryTalk® View.
- steps for converting PanelBuilder applications.
- names of equivalent graphic objects in PanelBuilder and FactoryTalk View.
- PanelBuilder graphic objects that are not supported in FactoryTalk View.
- PanelBuilder settings and controls that are not supported in FactoryTalk View.
- how communications are converted and which PanelBuilder communication protocols are not supported in FactoryTalk View.
- converting PanelBuilder Remote I/O communications.
- PanelBuilder graphic object features that are not supported in FactoryTalk View, with information about how to achieve the same result when possible.

This appendix uses the term PanelBuilder to refer to both PanelBuilder and PanelBuilder32 features.

For information about converting applications from PanelBuilder 1400e, see Appendix A.

Terminology

These terms are different in PanelBuilder and FactoryTalk View.

PanelBuilder term	FactoryTalk View term
screen	display, graphic display
programmable controller	data source
control	connection

In FactoryTalk View, the data source can be memory or a device such as a programmable controller or an OPC® server. FactoryTalk View writes values to and reads values from the data source. The data source is configured to exchange information (in the form of

numeric or string values) between FactoryTalk View and the machine that your application is controlling. The general term data source is used unless specifically discussing a programmable controller.

Summary of steps

Follow these steps to convert PanelBuilder applications:

1. Convert the application file, as described in the next section.
2. Specify additional project settings, as described on page 4-11.

   For example, if you want the application to have a border around its graphic displays, or to use a title bar, you can specify these options in the Project Settings editor.
3. If you select Convert to new window size, check the position of the graphic objects in each display.
4. Set up communications and edit tags that don't convert directly.

   For more information, see page B-8.
5. Set up graphic object features that don't convert directly.

   For more information, see page B-10.

Converting PanelBuilder application files

Follow these steps to convert a PanelBuilder application file, with the extension .pba or .pva, to an FactoryTalk View application file, with the extension .med. The original PanelBuilder application file is not modified by the conversion.

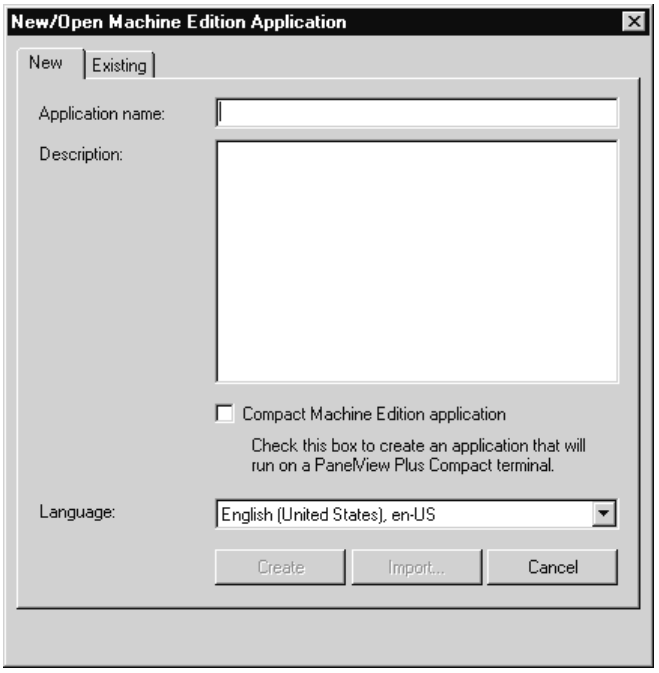
Steps to take in PanelBuilder before you convert the application

1. Semicolons (;) in tag addresses are supported in PanelBuilder, but not in FactoryTalk View Studio. Before importing the PanelBuilder application, in the PanelBuilder Tag Editor, change the semicolons to colons (:).
2. Dashes (-) in tag names are supported in PanelBuilder, but not in FactoryTalk View Studio. Before importing the PanelBuilder application, in the PanelBuilder Tag Editor, locate any tags whose names contain dashes and duplicate the tags. Then rename the tags without the dash, or replace the dash with an underscore (_). Once the tags have been renamed, use the Tag Search feature to find the graphic objects using the original tag names and edit the objects to replace the old tag names with the new ones.

You can convert the PanelBuilder application when you open FactoryTalk View Studio, or once FactoryTalk View Studio is already open.

To convert a PanelBuilder application when you open FactoryTalk View Studio

1. Open FactoryTalk View Studio.

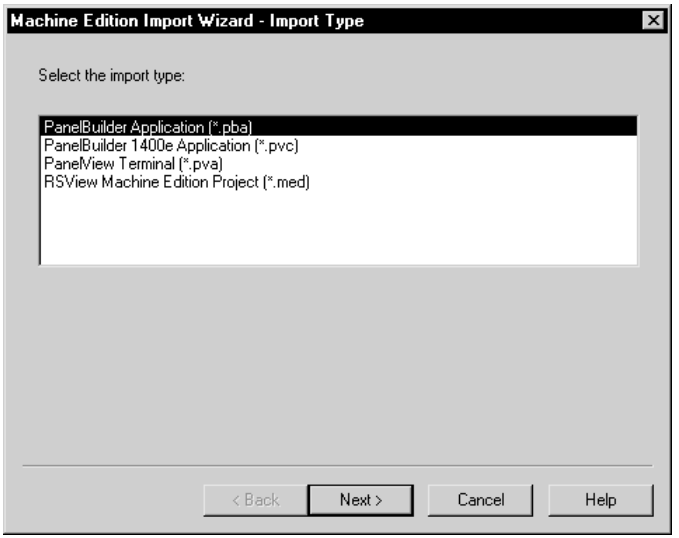


2. In the New tab, in the Application name box, type a name for your converted application, up to 32 characters long.
3. If desired, type a description of the application.

   If the PanelBuilder application contains an Application Description, the Application Description will overwrite the description you type here. You can add or change the description later, as described on page 4-18.
4. If the application is intended to run as a Compact Machine Edition application, check this box. If the application exceeds the limits for Compact applications, the application will be created as a regular, non-Compact application.
5. Specify the last language that was used to edit the application. This will be used for the converted application.

You can only import one language for your application, even if the original application uses multiple languages. The imported language will be the last language used to edit the application. For information about using different languages, see Chapter 12.

6. Click Import.



7. Follow the steps in the Machine Edition Import Wizard.

   For details about the options in the Machine Edition Import Wizard, see Help.

When you complete the steps of the wizard, FactoryTalk View Studio converts the PanelBuilder application, creates the converted application's folders and files, and then displays the converted application in the Explorer window in FactoryTalk View Studio.

If there are any messages about conversion, they are displayed automatically in the Project Status dialog box.

The converted application is created in the ME\HMI projects directory, in a folder with the same name as the application name you specified in step 2.

This is the path to the ME\HMI projects directory:

\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME\HMI projects (Windows XP or Windows Server 2003 R2)

or

\Users\Public\Public Documents\RSView Enterprise\ME\HMI projects (Windows Vista,Windows 7 Professional or Windows Server 2008)

Conversion messages are saved in a file called Convert.log, in the HMI projects directory.

To convert a PanelBuilder application when FactoryTalk View Studio is already open

New Application

1. On the File menu, click New Application, or click the New Application tool.

   If an application is already open, FactoryTalk View Studio asks you whether to close the application that is currently open. Click Yes.

2. Follow steps 2 through 7 in the previous procedure.

Equivalent graphic objects

This section describes graphic objects that are equivalent in PanelBuilder and FactoryTalk View, but have different names in the two products.

This PanelBuilder object	Is converted to this FactoryTalk View object	Notes
Numeric Entry Keypad Enable Button	Numeric input enable button	
Numeric Entry Cursor Point	Numeric input enable button	
Increment/Decrement Entry Button	Numeric input enable button	The numeric input enable button is set up to work as a ramp button, using the Fine Step value. The Coarse Step value is not converted.
ASCII Entry Keypad Enable button	String input enable button	The Show Current String on ASCII Scratchpad setting is not converted. The pop-up scratchpad or keyboard is always blank when opened.
ASCII Entry Cursor Point	String input enable button	The Show Current String on ASCII Scratchpad setting is not converted. The pop-up scratchpad or keyboard is always blank when opened.
Message Display	Multistate indicator	

This PanelBuilder object	Is converted to this FactoryTalk View object	Notes
Numeric Data Display	Text	The text object contains a numeric embedded variable that displays the read tag. If the original numeric data display object does not contain text, manually create a numeric display object with the desired properties in FactoryTalk View.
Connected Line	Polyline	
Circle	Ellipse	The ellipse has a circular shape.
Freeform	Freehand	
Screen List Selector	Display list selector	
Goto Screen Button	Goto display button	
Return Screen Button	Return to display button	
New Password Button	Password button	
Print Alarm List Button	Print alarm history button	
Clear Alarm List Button	Clear alarm history button	

Unsupported graphic objects

These PanelBuilder objects are not supported in FactoryTalk View:

- Print Only Object
- Circular Scale
- Scrolling Text
- Print Alarm Button
- Horn Silence Button
- Lamp/Horn Test Button
- Select Operator Button
- Enable/Disable Security Button
- Verify Password Button. The FactoryTalk View Password button opens a dialog box that allows the user to type and verify a new password.

Unsupported settings and controls

This section describes PanelBuilder settings and controls that are not used in FactoryTalk View.

Settings and controls for alarms

FactoryTalk View does not use these PanelBuilder features and settings to manage alarms:

- Ack setting for alarm messages; in FactoryTalk View, all alarms can be acknowledged
- bit alarm acknowledgement

FactoryTalk View does not use these PanelBuilder controls to manage alarms:

- Remote Ack All Handshake Tag
- Remote Clear All Alarm Tag
- Remote Clear All Alarm Handshake Tag

Invalid characters in screen names and tag names

Characters in PanelBuilder screen names and tag names that are not supported in FactoryTalk View are replaced with the underscore character.

Time and date

PanelBuilder time and date formats are not converted. For details about FactoryTalk View time and date formats, see page 21-15.

External fonts

PanelBuilder external fonts are not converted. When you convert your application you can specify the font to use instead. For details, see Help for the Machine Edition Import Wizard.

Screen security settings

PanelBuilder screen security settings are not converted, because FactoryTalk View uses a different method to assign security to graphic displays. For information about setting up security in FactoryTalk View, see Chapter 11.

Power-up options

These PanelBuilder power-up options are not imported into FactoryTalk View:

- Write Last Terminal State to Controller
- Display Last User Screen
- Use Terminal Presets

Converting non-RIO communications

This section describes how communications that do not use Remote I/O (RIO) are converted. For information about converting RIO communications, see page B-9.

FactoryTalk View does not use nodes for communications. Nodes are converted to RSLinx® topics. Topics are then converted into device shortcuts, to run with RSLinx® Enterprise™. You must have both RSLinx® Classic™ and RSLinx Enterprise installed to make this two-step conversion.

If you import an application multiple times, delete the device shortcuts in RSLinx Enterprise before re-importing. Otherwise, multiple unused topics will be created in RSLinx Enterprise.

For more information about setting up communications, see Chapter 5.

Tags for unsupported communication protocols

Some communication protocols are not supported in FactoryTalk View. For example, DH+™ communications that use the AutoMax node type are not supported. FactoryTalk View does not support CIP and Assembly Object addressing (used in PanelBuilder32 Ethernet communications).

Tags that use unsupported communication protocols are converted to HMI memory tags. Once you have set up communications for your converted application, change the memory tags to device tags that point to the correct addresses. All other imported tags are converted to HMI device tags.

For information about editing HMI tags, see Chapter 7. For more information about which communication protocols are not supported, see Help or see the Rockwell Automation Knowledgebase.

Bit array tags

You can monitor bit arrays for alarm conditions in FactoryTalk View, but you can't assign bit arrays to most graphic objects or write to bit arrays. (The only exception is the piloted control list selector object. For this object, you can assign a bit array tag to the Visible States connection.)

All bit array tags in your PanelBuilder application are converted to HMI memory tags.

For information about monitoring bit arrays for alarm conditions, see Chapter 9. For information about editing HMI tags, see Chapter 7. For information about the piloted control list selector, see Help.

Converting RIO communications

Remote I/O (RIO) communications are not supported for applications that will run on personal computers. You can use RIO communications on the PanelView™ Plus and PanelView™ Plus CE run-time platforms.

Supported PanelBuilder tags are converted to HMI device tags and RSLinx aliases. For information about unsupported PanelBuilder tags, see below.

To convert an RIO application from PanelBuilder to FactoryTalk View

1. Convert the application, as described on page B-2.
2. Open the RSLinx Enterprise data server, and then double-click Communication Setup.
3. In the Communication Setup editor, add an RIO driver.
   - For PanelView Plus 400 and 600 terminals, use the 2711P-RN1 driver.
   - For all other PanelView Plus or PanelView Plus CE terminals, use the 2711P-RN6 driver.

   For information about adding drivers in RSLinx, see RSLinx Help.
4. Expand the RIO tree, right-click RIO Data, and then click Configure RIO.
5. In the RIO Configuration dialog box, right-click RIO, and then click Import.
6. Browse to the location of the RIO configuration file.

   The file is saved in the root of the application's directory.
7. In the Communications Setup editor, create a device shortcut named "PVRIO" that points to the RIO data device.

   For information about creating a device shortcut, see RSLinx Help.
8. Correct any invalid RIO configurations. Invalid RIO configurations are highlighted with red "x" icons.
9. Save the converted RIO application.

Unsupported PanelBuilder RIO tags

A PanelBuilder RIO tag will be converted to an HMI memory tag and an error will be logged to the conversion log file if the RIO tag:

- has a blank address.
- has a data type of Bit Array and its address does not have an array size of 1, 8, 16, or 32.

- has a data type of Bit Array, and its array size is 16 or 32, but its address does not have a bit offset of 0.
- has a data type of Bit or BOOL, and its address does not contain the bit delimiter character "/".
- has a data type of 4-BCD, Unsigned Integer, Signed Integer or INT, Character Array, or DINT, and its address contains the bit delimiter character "/".
- is a block transfer tag with a data type of Bit Array, and its array size is 8, but its address does not have a bit offset of 0 or 8.
- is a block transfer tag with a data type of SINT, and its address does not have a bit offset of 0 or 8.
- is an I/O tag with an address that references an undefined rack.
- is an I/O tag with a data type of SINT, and its address does not have a bit offset of 0 or 10.
- does not have a valid I/O address or block transfer address.

Unsupported graphic object features

This section describes features of PanelBuilder graphic objects that are not supported in FactoryTalk View. The Notes column provides additional information and describes methods for achieving the same result when possible.

Graphic object	Unsupported feature in FactoryTalk View	Notes
Image text, arc, ellipse, freehand, line, polyline, rectangle, wedge	Blink property	In FactoryTalk View, all of the listed objects except images use color animation to blink. For details, see page 22-10. Color images do not blink. Monochrome images use the Blink property to blink.
Increment/Decrement Entry Button (Converted to numeric input enable button)	Allow Home/End Allow Wrap Ramping by coarse steps	

Graphic object	Unsupported feature in FactoryTalk View	Notes
Maintained Push Button, Multistate Push Button, Standard Control List Selector	Initial state values	If you want to set these objects' states on application startup, create a macro to set the appropriate tag values for the objects' connections. For information about macros, see Chapter 30. Assign the macro in the Startup editor. For details, see Help.
Multistate Indicator, Message Display	Print Setting	
Bar Graph	Inner text and inner graphic	Converted to a separate text object and image object.
Gauge	Inner text and inner graphic	Converted to a separate text object and image object.
	Scale clipping	If the scale doesn't fit within the height or width of the gauge, it is not clipped. Check the position of the scale to ensure it doesn't overlap other objects.
	Needle	Converted to a separate gauge object; if the gauge had 2 needles, each needle is converted to a separate gauge object.
Alarm List	No Acknowledgement Required	All alarms can be acknowledged.
All objects	Image placement	FactoryTalk View supports one, three or nine positions for images, depending on the type of object. On conversion, images are positioned using the closest match. Therefore some images might be clipped to fit the object.
All objects	Turn Object View On property	If this property is set to False, the converted object has a transparent background, no border, no caption, and no image.
All objects	Blinking inner graphics	If the inner graphic uses a color image, it will not blink. Use a monochrome image if you want the inner graphic to blink.

APPENDIX C

System tags

This appendix describes system tags.

System tags are preconfigured HMI tags created by FactoryTalk® View. System tags are read-only. Display them as needed in your application.

Alarms

The following tag contains the time and date when the status of alarms was last reset. The date uses the long date format.

Tag name	Type	Function
system\AlarmReset DateAndTimeString	String	Contains the date and time of the last alarm reset.

For information about resetting alarms, see page 9-9.

Graphics

The following HMI tags can be used to make graphic objects appear as though they are blinking on and off:

Tag name	Type	Function
system\BlinkFast	Digital	Toggles on and off every 100 ms (10 times per second).
system\BlinkSlow	Digital	Toggles on and off every 500 ms (twice per second).

A more efficient way to make graphic objects blink is to use the blinking color option in color animation. For details, see page 22-10.

Also, many objects have a Blink property that you can set up. For information about specific objects, see Help.

Time

These HMI tags record time and date information in various formats:

Tag Name	Type	Provides this data	Read or write
system\Date	String	System date.	Read only
system\DateAndTime Integer	Analog	Number of seconds elapsed since midnight (00:00:00) January 1, 1970, coordinated universal time.	Read only
system\DateAndTime String	String	Complete date and time display. For example: Monday, December 12 2001 10:47:50 AM	Read only
system\DayOfMonth	Analog	Day of the month (1 - 31).	Read only
system\DayOfWeek	Analog	Day of the week (1-7); Sunday = 1.	Read only
system\DayOfYear	Analog	Day of the year (1-366).	Read only
system\Hour	Analog	Hour of the day (0-23).	Read and write
system\Minute	Analog	Minutes (0 - 59).	Read and write
system\Month	Analog	Number for month (1-12).	Read only
system\MonthString	String	Name of the month.	Read only
system\Second	Analog	Seconds (0 - 59).	Read and write
system\Time	String	System Time.	Read only
system\Year	Analog	The year (1980-2099).	Read only

For information about using the data source to update the system date and time, or about sending the run-time computer's date and time to the data source, see Chapter 8.

User

This tag contains the name of the current user:

Tag Name	Type	Function
system\User	String	Contains name of logged-in user.

We recommend that you use the expression security function CurrentUserName( ) instead of the system\User tag, especially if you intend to convert the application to FactoryTalk View Supervisory Edition. In distributed applications, system\User returns the name of the user logged into the HMI server, not the user logged into the display client.

For more information about the security functions, see page 23-14.

APPENDIX D

ODBC database schema

This appendix describes the ODBC database format, or schema, for messages from FactoryTalk® Diagnostics. The target table of the ODBC database to which you are sending messages must use the format shown in this appendix.

The option of logging FactoryTalk Diagnostics messages to an ODBC database is available for personal computers only.

For information about setting up FactoryTalk Diagnostics, see Chapter 10.

FactoryTalk Diagnostics log table

FactoryTalk Diagnostics log data in ODBC format uses one table.

This column	Contains	SQL data type	Length
TimeStmp	The time and date data was logged, in coordinated universal time format. Encoded as a date variant.	SQL_TIMESTAMP	Driver dependent
MessageText	Message to be logged.	SQL_VARCHAR, *or* SQL_CHAR	254
Audience	A number representing the message audience: 0 for Operator 1 for Engineer 2 for Developer 3 for Secure	SQL_SMALLINT, *or* SQL_INTEGER	1
Severity	A number representing the severity of the diagnostics message: 0 for Error 1 for Warning 2 for Information 3 for Audit	SQL_SMALLINT, *or* SQL_INTEGER	1
Area	The FactoryTalk path to the area in which the activity occurred. Used for FactoryTalk® View Site Edition only.	SQL_VARCHAR, *or* SQL_CHAR	80
Location	The name of the computer where the message was generated.	SQL_VARCHAR, *or* SQL_CHAR	15

This column	Contains	SQL data type	Length
UserID	The name of the user (including domain name, if there is one) that initiated the action that caused the diagnostics message. If the diagnostics message was caused by an HMI server, the user column contains "System."	SQL_VARCHAR, *or* SQL_CHAR	38
UserFullName	The full name of the user that was logged in when the activity occurred.	SQL_VARCHAR, *or* SQL_CHAR	255
Provider	The name of the product that generated the message.	SQL_VARCHAR, *or* SQL_CHAR	20

APPENDIX E

Importing and exporting alarm XML files

This appendix describes:

- creating alarm XML files.
- exporting, editing, and importing XML files.
- the alarm XML file structure.

About XML

XML is the Extensible Markup Language used to create documents with structured text information. It has a standardized format and structure. You can use XML to edit the elements and attributes needed to create an alarm setup file or to modify graphic displays. For information about working with graphics XML files, see Appendix H.

Sometimes editing your alarm setup in an XML file is quicker than working in FactoryTalk® View. For example, if you have a list of 100 tags to monitor for alarms, with multiple messages for each tag, you might prefer to enter all the information in a text editor, and then import the alarm setup information into FactoryTalk View.

Another example of using XML files is to export the alarm setup information you develop in one application, import the setup information to another FactoryTalk View application, and then modify the alarm setup as needed. Or, you could modify the information in the XML file before importing it.

For more information about XML, see the World Wide Web Consortium's web page about XML at:
http://www.w3.org/XML.

Creating alarm XML files by exporting

The quickest way to create an XML file for your application's alarm setup is to export the data from FactoryTalk View. You can then open the XML file in Notepad, make your changes, and import the file back into FactoryTalk View.

The strings for the application's current language are exported to the XML file. To export strings for another language, reopen the application in the new language and repeat the XML export.

To export alarm information to an XML file

1. In the Explorer window, right-click the Alarm Setup editor.
2. Click Import and Export.

The Alarm Import Export Wizard opens.

3. Follow the instructions in the wizard.

   For information about using the Alarm Import Export Wizard, see Help.

FactoryTalk View creates a file with the name you specify, in the location you specify.

Editing XML files

We recommend that you use Notepad to edit your XML files.

If you do not want to change a property, you don't need to include it in the XML file.

Saving XML files in Notepad

Save XML files created or edited in Notepad using either UTF-8 or UTF-16 file format. Notepad's Unicode file type corresponds to UTF-16 file format. For files containing strings in English or other Latin-based languages, UTF-8 is recommended, to reduce the size of the XML file. For other languages such as Chinese, Japanese, or Korean, UTF-16 is recommended.

The first line of every XML file contains XML version and encoding attributes. Make sure the encoding attribute matches the format that you are going to use when you save the file. For example, if the original file was saved in UTF-8 format and you plan to save it in UTF-16 format, make sure the first line specifies encoding="UTF-16".

Testing XML files

An XML file must be well-formed to be imported. To find out whether your XML file is well-formed, test it.

To test an XML file

- Open the XML file in Internet Explorer.

If you can see the XML code, your file is well-formed. If the XML code is not well-formed, Internet Explorer displays an error message.

Importing XML files

You can import an alarm setup that has been created using an external programming tool or editor, or you can import an XML file that you originally exported from FactoryTalk View and then modified.

When you import an alarm setup, your existing alarm setup will be overwritten. Back up your application first, using the Application Manager tool. Or, you can save a copy of your existing alarm setup by exporting it to an XML file before you import the new one.

If the application is a Compact Machine Edtion application, only the number of alarms allowed by the Compact application limits will be imported.

Error log file

If errors occur during importing, the errors are logged to a text file. The file opens automatically when importing is finished. The last paragraph of the file lists the location of the file.

Importing alarm XML files

To import alarm information from an XML file

1. In the Explorer window, right-click the Alarm Setup editor.
2. Click Import and Export.

   The Alarm Import Export Wizard opens.
3. Follow the instructions in the wizard.

   For more information about using the Alarm Import Export Wizard, see Help.

Alarm setup XML file structure

The alarm setup XML file is a FactoryTalk View XML document that describes the alarm setup for an application. The root element of the XML document is called **alarms**. It represents the Alarm Setup editor. An XML document can contain only one root element. All other elements in the document must be contained or nested within the root element.

In an XML document, the start of an element is marked **<element name>**. The end is marked **</element name>**.

If the element contains no subelements, the end can be marked **/>**. For example, <trigger id="T1" type="value" ack-all-value="0" />.

The syntax for specifying an attribute for an element is **attribute="value"**. The attribute value must be enclosed in single or double quotes.

Here is a sample structure for an alarm XML document:.

Element	Description
<alarms>	Root element.
<alarm>	Contains attributes from the Advanced tab of the Alarm Setup editor, as well as the triggers and messages elements.
<triggers>	Contains a trigger element for each trigger in the Triggers tab of the Alarm Setup editor.
<trigger id="T1" />	Contains attributes for the first alarm trigger.
<trigger id="T2" />	Contains attributes for the second alarm trigger.
</triggers>	Indicates the end of the triggers element.
<messages>	Contains a message element for each message in the Messages tab of the Alarm Setup editor.
<message id="M1" />	Contains attributes for the first alarm message.
<message id="M2" />	Contains attributes for the second alarm message.
</messages>	Indicates the end of the messages element.
</alarm>	Indicates the end of the alarm element.
</alarms>	Indicates the end of the alarms element.

You can specify multiple attributes for an element. For example, the alarm element contains 11 possible attributes from the Advanced tab of the Alarm Setup editor.

For more information about alarm elements and their attributes, see Help for the Alarm Import Export Wizard.

APPENDIX F

RFC1766 names

This appendix describes RFC1766 names for Windows® languages.

Mapping languages to RFC1766 names

The following table lists the languages that Windows supports and the RFC1766 name associated with each language.

You can use the codes to name the translated application files before importing them. The codes are also used with the CurrentLanguage function.

RFC1766 Name	Language – Country/Region
af–ZA	Afrikaans – South Africa
sq–AL	Albanian – Albania
ar–DZ	Arabic – Algeria
ar–BH	Arabic – Bahrain
ar–EG	Arabic – Egypt
ar–IQ	Arabic – Iraq
ar–JO	Arabic – Jordan
ar–KW	Arabic – Kuwait
ar–LB	Arabic – Lebanon
ar–LY	Arabic – Lybia
ar–MA	Arabic – Morocco
ar–OM	Arabic – Oman
ar–QA	Arabic – Qatar
ar–SA	Arabic – Saudi Arabia
ar–SY	Arabic – Syria
ar–TN	Arabic – Tunisia
ar–AE	Arabic – United Arab Emirates
ar–YE	Arabic – Yemen
hy–AM	Armenian – Armenia
az–AZ–Cyrl	Azeri (Cyrillic) – Azerbaijan
az–AZ–Latn	Azeri (Latin) – Azerbaijan

RFC1766 Name	Language – Country/Region
eu–ES	Basque – Basque
be–BY	Belarusian – Belarus
bg–BG	Bulgarian – Bulgaria
ca–ES	Catalan – Catalan
zh–HK	Chinese – Hong Kong SAR (Default Sort Order – Stroke Count)
zh–HK	Chinese – Hong Kong SAR (Alternate Sort Order – Stroke Count)
zh–MO	Chinese – Macau SAR (Default Sort Order – Pronunciation)
zh–MO	Chinese – Macau SAR (Alternate Sort Order – Stroke Count)
zh–CN	Chinese – China (Default Sort Order – Pronunciation)
zh–CN	Chinese – China (Alternate Sort Order – Stroke Count)
zh–SG	Chinese – Singapore (Default Sort Order – Pronunciation)
zh–SG	Chinese – Singapore (Alternate Sort Order – Stroke Count)
zh–TW	Chinese – Taiwan (Default Sort Order – Stroke Count)
zh–TW	Chinese – Taiwan (Alternate Sort Order – Bopomofo)
hr–HR	Croatian – Croatia
cs–CZ	Czech – Czech Republic
da–DK	Danish – Denmark
div–MV	Dhivehi – Maldives
nl–BE	Dutch – Belgium
nl–NL	Dutch – The Netherlands
en–AU	English – Australia
en–BZ	English – Belize
en–CA	English – Canada
en–CB	English – Caribbean
en–IE	English – Ireland
en–JM	English – Jamaica
en–NZ	English – New Zealand
en–PH	English – Philippines
en–ZA	English – South Africa
en–TT	English – Trinidad and Tobago
en–GB	English – United Kingdom

RFC1766 Name	Language – Country/Region
en–US	English – United States
en–ZW	English – Zimbabwe
et–EE	Estonian – Estonia
fo–FO	Faroese – Faroe Islands
fa–IR	Farsi – Iran
fi–FI	Finnish – Finland
fr–BE	French – Belgium
fr–CA	French – Canada
fr–FR	French – France
fr–LU	French – Luxembourg
fr–MC	French – Monaco
fr–CH	French – Switzerland
mk–MK	FYRO Macedonian
gl–ES	Galician – Galician
ka–GE	Georgian – Georgia (Default Sort Order – Traditional)
ka–GE	Georgian – Georgia (Alternate Sort Order – Modern Sort)
de–AT	German – Austria
de–DE	German – Germany (Default Sort Order – Dictionary)
de–DE	German – Germany (Alternate Sort Order – Phone Book Sort DIN)
de–LI	German – Liechtenstein
de–LU	German – Luxembourg
de–CH	German – Switzerland
el–GR	Greek – Greece
gu–IN	Gujarati – India
he–IL	Hebrew – Israel
hi–IN	Hindi – India
hu–HU	Hungarian – Hungary (Default Sort Order)
hu–HU	Hungarian – Hungary (Alternate Sort Order – Technical Sort)
is–IS	Icelandic – Iceland
id–ID	Indonesian – Indonesia
it–IT	Italian – Italy

RFC1766 Name	Language – Country/Region
it–CH	Italian – Switzerland
ja–JP	Japanese – Japan (Default Sort Order)
ja–JP	Japanese – Japan (Alternate Sort Order – Unicode)
kn–IN	Kannada – India
kk–KZ	Kazakh – Kazakhstan
kok–IN	Konkani – India
ko–KR	Korean – Korea (Default Sort Order)
ko–KR	Korean – Korea (Alternate Sort Order – Korean Xwansung Unicode)
ky–KZ	Kyrgyz – Kazakhstan
lv–LV	Latvian – Latvia
lt–LT	Lithuanian – Lithuania
ms–BN	Malay – Brunei
ms–MY	Malay – Malaysia
mr–IN	Marathi – India
mn–MN	Mongolian – Mongolia
nb–NO	Norwegian (Bokml) – Norway
nn–NO	Norwegian (Nynorsk) – Norway
pl–PL	Polish – Poland
pt–BR	Portuguese – Brazil
pt–PT	Portuguese – Portugal
pa–IN	Punjabi – India
ro–RO	Romanian – Romania
ru–RU	Russian – Russia
sa–IN	Sanskrit – India
sr–SP–Cyrl	Serbian (Cyrillic) – Serbia
sr–SP–Latn	Serbian (Latin) – Serbia
sk–SK	Slovak – Slovakia
sl–SI	Slovenian – Slovenia
es–AR	Spanish – Argentina
es–BO	Spanish – Bolivia
es–CL	Spanish – Chile

RFC1766 Name	Language – Country/Region
es–CO	Spanish – Colombia
es–CR	Spanish – Costa Rica
es–DO	Spanish – Dominican Republic
es–EC	Spanish – Ecuador
es–SV	Spanish – El Salvador
es–GT	Spanish – Guatemala
es–HN	Spanish – Honduras
es–MX	Spanish – Mexico
es–NI	Spanish – Nicaragua
es–PA	Spanish – Panama
es–PY	Spanish – Paraguay
es–PE	Spanish – Peru
es–PR	Spanish – Puerto Rico
es–ES	Spanish – Spain (Default Sort Order – International)
es–ES	Spanish – Spain (Alternate Sort Order – Traditional)
es–UY	Spanish – Uruguay
es–VE	Spanish – Venezuela
sw–KE	Swahili – Kenya
sv–FI	Swedish – Finland
sv–SE	Swedish – Sweden
syr–SY	Syriac – Syria
ta–IN	Tamil – India
tt–RU	Tatar – Russia
te–IN	Telugu – India
th–TH	Thai – Thailand
tr–TR	Turkish – Turkey
uk–UA	Ukrainian – Ukraine
ur–PK	Urdu – Pakistan
uz–UZ–Cyrl	Uzbek (Cyrillic) – Uzbekistan
uz–UZ–Latn	Uzbek (Latin) – Uzbekistan
vi–VN	Vietnamese – Vietnam

APPENDIX G

Features supported in different versions of FactoryTalk View

This appendix describes:

- which versions of FactoryTalk® View ME Station are supported.
- which features are not supported in previous versions of FactoryTalk View ME Station.

Which versions are supported

FactoryTalk® View Studio allows you to create run-time (.mer) files for these versions of FactoryTalk View ME Station:

- FactoryTalk View ME Station version 6.10
- FactoryTalk View ME Station version 6.00
- FactoryTalk View ME Station version 5.10
- FactoryTalk View ME Station version 5.00
- RSView® ME Station version 4.00
- RSView ME Station version 3.20
- RSView ME Station version 3.10
- RSView ME Station version 3.00(Studio can open 3.0, but cannot create a 3.0 MER.)

Multiple version support is useful for system designers and others who create and modify applications for different versions of FactoryTalk View ME Station on an ongoing basis. You can use the latest version of FactoryTalk View Studio on a single development computer to provide applications for terminals that use previous versions of FactoryTalk View ME Station.

To check which version of FactoryTalk View ME Station you are using:

1. In FactoryTalk View ME Station, click Terminal Settings.
2. Click System Information.
3. Click About FactoryTalk View ME Station.

Creating run-time application files for previous versions

When you create the run-time application file (with the file extension .mer), you can specify the version of FactoryTalk View ME Station for which to create the file. For example, if the application will run on a terminal that uses RSView ME Station version 3.20, you can specify that version for the .mer file.

If the application contains features that are not supported by the version you select, FactoryTalk View displays a validation report that lists the unsupported features. The run-time application file is not created. You must remove or turn off the unsupported features before you can create the run-time application file.

For information about creating run-time application files, see Chapter 14.

The remainder of this appendix lists the features that are not supported in previous versions of FactoryTalk View ME Station. The tables also show how to remove or replace the unsupported features.

Features that are not supported in version 5.10 or earlier

These version 6.0 features are not supported in version 5.10 of RSView ME Station, nor in earlier versions. The right column describes how to remove or replace the feature.

To remove or replace this feature	Do this
Graphics objects with Shaded and Original animation is not support on v5.10 or earlier release.	Delete the Shaded or Original animation from Graphics objects animation. Or User can select Solid in Fill Style to create version5.1 mer

Features that are not supported in version 5.00 or earlier

These version 5.10 features are not supported in version 5.00 of RSView ME Station, nor in earlier versions. The right column describes how to remove or replace the feature.

To remove or replace this feature	Do this
Tag or expression assigned to the Close an On Top Display or Close All On Top Displays connections	Delete the tag or expression assigned in the Display tab of the Global Connections editor.
Tag or expression assigned to the Parameter File or Use Parameter List connections	Delete the tag or expression assigned in the Display tab of the Global Connections editor.

To remove or replace this feature	Do this
Tag or expression assigned to one or more of the Parameter Tag #1-10 connections	Delete the tag or expression in the Display tab of the Global Connections editor.
Parameter list property assigned in the Properties dialog box of a Display List Selector, Goto Display button, or Logout button graphic object	In the object's Properties dialog box, clear the Parameter list assignment.
Parameter list property assigned to the display specified for auto logout in Project Settings	In the Project Settings editor's Runtime tab, clear the Parameter list assignment.
Parameter list assigned to the Initial graphic property in the Startup editor	In the Startup editor, clear the Parameter list assignment for the Initial graphic.
Use variable minimum/maximum property assigned to Numeric Input Cursor Point or Numeric Input Enable object	In the Numeric tab of the object's Properties dialog box, clear the Use variable minimum/maximum property.
Caption on Keypad property assigned to Numeric Input Cursor Point object	In the Numeric tab of the object's Properties dialog box, set the Caption on keypad/scratchpad property to blank.
Minimum or Maximum connections assigned for Numeric Input Cursor Point or Numeric Input Enable object	In the Connections tab of the object's Properties dialog box, delete the tag or expression assigned to the Minimum or Maximum connection.
Use variable ramp or Use variable limit property set for the Ramp button object	In the General tab of the object's Properties dialog box, clear the Use variable lower/upper limit and Use variable ramp value properties.
Ramp or Limit connection set for the Ramp button object	In the Connections tab of the object's Properties dialog box, delete the tag or expression assigned to the Ramp or Limit connection.
The application is designated as a Compact Machine Edition application in Project Settings	In the General tab of the Project Settings editor, clear the Compact Machine Edition application check box.

Features that are not supported in version 4.00 or earlier

These version 5.00 features are not supported in version 4.00 of RSView ME Station, nor in earlier versions. The right column describes how to remove or replace the feature.

To remove or replace this feature	Do this
Delete action assigned to a RecipePlus button graphic object	Delete the button or change the action to Download, Upload, Upload and Create, Restore, or Save.
Rename action assigned to a RecipePlus button graphic object	Delete the button or change the action to Download, Upload, Upload and Create, Restore, or Save.
"Display undefined strings using the default language" option	In the Language Configuration dialog box, clear the option's checkbox.
Tag assigned to the MERuntime RAM Usage, Total RAM Usage, or Available RAM connection	Unassign the tag in the Memory tab of the Global Connections editor.
Tag or expression assigned to the Remote RAM Usage connection	Unassign the tag or expression in the Memory tab of the Global Connections editor.
CaptionOnBorder property assigned to graphic object	In the Property Panel, set the object's CaptionOnBorder property to False.
Embedded variable "L" character assigned to a caption or message	Select the Tag radio button in the Numeric Variable or String Variable dialog box for the caption or message.
Minus sign (-) qualifier used to show right-most text assigned to a caption or message	Clear the "Right-most characters in string are displayed" checkbox in the String Variable dialog box for the caption or message.
SHOWSTAR qualifier assigned to a caption or message	Clear the "Show * character if string is longer than field width" checkbox in the String Variable dialog box for the caption or message.
Embedded variable assigned to the title bar of an On Top display	Remove the embedded variable.
RSLinx® Enterprise™ Remote I/O alias with a BitArray data type	Assign a different data type to the alias.
Global object parameter definition or value	Delete the global object parameter definition. The corresponding value will be deleted automatically. Use parameter files instead.

Features that are not supported in version 3.20 or earlier

The features listed in the previous table are not supported in version 3.20 of RSView ME Station. In addition, these version 4.00 features are not supported in version 3.20 of RSView ME Station, nor in earlier versions. The right column describes how to remove or replace the feature.

To remove or replace this feature	Do this
Unsupported RSLinx Enterprise feature or shortcut—warning	Delete or replace the feature or shortcut. A hardware patch might be available that allows you to use the feature. Therefore, the run-time application file will still be created.
Unsupported RSLinx Enterprise feature or shortcut—error	Delete or replace the feature or shortcut.
Global reference object that is not linked to a global base object	Delete the global reference object, or link it to a global base object. All global reference objects that are linked to global base objects will be converted to standard graphic objects in the .mer file.
Language switch button graphic object	Delete the button.
Password button graphic object	Delete the button.
RecipePlus button graphic object	Delete the button.
RecipePlus selector graphic object	Delete the selector.
RecipePlus table graphic object	Delete the table.
Acknowledge all alarms button with a filtered trigger	Clear the Filtered triggers box.
Print alarm history button with a filtered trigger	Clear the Filtered triggers box.
Print alarm status button with a filtered trigger	Clear the Filtered triggers box.
Clear alarm history button with a filtered trigger	Clear the Filtered triggers box.
Clear alarm history button with the Reset alarm status option cleared	Select Reset alarm status.

Features that are not supported in version 3.10 or earlier

The features listed in the previous tables are not supported in version 3.10 of RSView ME Station. In addition, these version 3.20 alarm options are not supported in version 3.10, nor in earlier versions. The right column describes how to remove or replace the feature.

To remove or replace this feature	Do this

Alarm list graphic object with an unsupported combination of alarm conditions	Do one of the following:
	■ Select the Display check box for each alarm condition
	■ Select the Display check box for only these alarm conditions:
	  ■ Active and unacknowledged
	  ■ Inactive and unacknowledged.

Alarm list graphic object with Blink selected for one or more alarm conditions	For all alarm conditions that you are displaying, clear the Blink check box.
Alarm list graphic object with Use alarm colors turned off for one or more alarm conditions	For all alarm conditions that you are displaying, select the Use alarm colors check box.
Alarm list graphic object with the Acknowledged symbol column turned off	Select the Display column check box for the Acknowledged symbol column.
Alarm list graphic object with an Acknowledged symbol other than *	Change the Acknowledged symbol to *.
Alarm list graphic object with the Active symbol column displayed	Clear the Display column check box for the Active symbol column.
Alarm list graphic object with tags or expressions assigned to one or more connections	Clear the tags or expressions assigned to the connections.
Alarm list graphic object with Selected alarm indicator set to Cursor	Change the Selected alarm indicator to Highlight bar.
Alarm list graphic object with Lines per alarm set to >1	Change the Lines per alarm to 1.
Alarm banner graphic object with Use alarm colors selected	Clear the Use alarm colors check box.

To remove or replace this feature	Do this
Alarm status list graphic object with Use alarm colors selected	Clear the Use alarm colors check box.
Alarm status list graphic object with Lines per alarm set to >1	Change the Lines per alarm to 1.
Alarm status list graphic object with a Fore color other than white	Change the Fore color to white.

APPENDIX H

Importing and exporting graphics XML files

This appendix describes:

- creating graphics XML files.
- exporting, editing, and importing XML files.
- the graphics XML file structure.

About XML

XML is the Extensible Markup Language used to create documents with structured text information. It has a standardized format and structure. You can use XML to edit the elements and attributes needed to create an alarm setup file or to modify graphic displays and global displays. For information about working with alarm XML files, see Appendix E.

Sometimes editing your display information in an XML file is quicker than working in FactoryTalk® View. For example, if you have a list of 100 local messages to set up for a graphic display, you might prefer to enter all the information in a text editor, and then import the display information into FactoryTalk View.

For more information about XML, see the World Wide Web Consortium's web page about XML at:
http://www.w3.org/XML.

Creating graphics XML files by exporting

The quickest way to create an XML file for your application's graphic displays is to export the data from FactoryTalk View. You can then open the XML file in Notepad, make your changes, and import the file back into FactoryTalk View.

The strings for the application's current language are exported to the XML file. To export strings for another language, reopen the application in the new language and repeat the XML export.

To export graphic display information to an XML file

1. In the Explorer window, right-click the Displays editor or the Global Objects editor.
2. Click Import and Export.

The Graphics Import Export Wizard opens.

3. Follow the instructions in the wizard.

   For information about using the Graphics Import Export Wizard, see Help.

FactoryTalk View creates XML files for the selected graphic displays, in the location you specify.

FactoryTalk View also creates a file called BatchImport_*Application name*.xml, in the same location. You can use this file to import multiple displays at the same time. To import a different set of displays than you exported, edit the list of display names in the BatchImport_*Application name*.xml file.

Editing XML files

We recommend that you use Notepad to edit your XML files.

If you do not want to change a property, you don't need to include it in the XML file. When you import the file, if you select the option "Create new objects in the display," properties that are not listed in the file are set to their default values. If you select the option "Update existing objects on the display," only properties that are listed in the file are updated with imported information.

If you include attributes for an object whose name does not match one of those in the graphic display, the attributes for that object are not imported. Attributes for all other objects in the file whose names do match the ones in the graphic display are imported.

Saving XML files in Notepad

Save XML files created or edited in Notepad using either UTF-8 or UTF-16 file format. Notepad's Unicode file type corresponds to UTF-16 file format. For files containing strings in English or other Latin-based languages, UTF-8 is recommended, to reduce the size of the XML file. For other languages such as Chinese, Japanese, or Korean, UTF-16 is recommended.

The first line of every XML file contains XML version and encoding attributes. Make sure the encoding attribute matches the format that you are going to use when you save the file. For example, if the original file was saved in UTF-8 format and you plan to save it in UTF-16 format, make sure the first line specifies encoding="UTF-16".

Testing XML files

An XML file must be well-formed to be imported. To find out whether your XML file is well-formed, test it.

To test an XML file

- Open the XML file in Internet Explorer.

If you can see the XML code, your file is well-formed. If the XML code is not well-formed, Internet Explorer displays an error message.

Importing XML files

You can import a graphic display or global object display that has been created using an external programming tool or editor, or you can import an XML file that you originally exported from FactoryTalk View and then modified.

When you import a graphic display or global object display, your existing display will be overwritten. Back up your application first, using the Application Manager tool. Or, you can save a copy of your existing display by exporting it to an XML file before you import the new one.

If the application is a Compact Machine Edtion application, only the number of displays allowed by the Compact application limits will be imported.

Error log file

If errors occur during importing, the errors are logged to a text file. The file opens automatically when importing is finished. The last paragraph of the file lists the location of the file.

Importing graphics XML files

You can import a single graphic or global object display XML file at a time, or import multiple displays. You can also choose whether to import new objects or update existing objects.

To import multiple displays, specify the names of the displays in the file BatchImport_*Application name*.xml. FactoryTalk View creates this file when you export multiple displays. For details, see page H-1.

To import display information from an XML file

1. In the Explorer window, right-click the Displays or Global Objects editor.
2. Click Import and Export.

   The Graphics Import Export Wizard opens.
3. Follow the instructions in the wizard.

   For more information about using the Graphics Import Export Wizard, see Help.

Graphics XML file structure

The graphic display or global object display XML file is a FactoryTalk View XML document that describes the objects and settings for a display. The root element of the

XML document is called **gfx**. It represents the display. An XML document can contain only one root element. All other elements in the document must be contained or nested within the root element.

In an XML document, the start of an element is marked **<element name>**. The end is marked **</element name>**.

If the element contains no subelements, the end can be marked />. For example, <caption fontFamily="Arial" fontSize="8" bold="false" />.

The syntax for specifying an attribute for an element is **attribute="value"**. The attribute value must be enclosed in single or double quotes.

Here is a sample structure for a graphic display XML document containing two graphic objects. The second object has states:

Element	Description
<gfx>	Root element.
<displaySettings />	Contains attributes from the Display Settings dialog box in the Graphics editor.
<*object1*>	Contains attributes from the General and Common tabs in the object's Properties dialog box, as well as elements for the object's caption, image, animation, and connections.
<caption />	Contains attributes for the object's caption.
<imageSettings />	Contains attributes for the object's image.
<animations>	Contains an animation element for each type of animation set up for the object.
<animateVisibility />	Contains attributes for Visibility animation.
<animateColor />	Contains attributes for Color animation.
</animations>	Indicates the end of the animations element.
<connections>	Contains a connection element for each connection assigned to the object.
<connection name= "Value" />	Contains attributes for the Value connection.
<connection name= "Indicator" />	Contains attributes for the Indicator connection.
</connections>	Indicates the end of the connections element.
</*object1*>	Indicates the end of the *object1* element.

Element	Description
<*object2*>	Contains attributes from the General and Common tabs in the object's Properties dialog box, as well as elements for the object's states and connections.
<states>	Contains state elements for each of the object's states.
<state stateid="0">	Contains attributes for the object's first state, as well as elements for the state's caption and image.
<caption />	Contains attributes for the state's caption.
<imageSettings />	Contains attributes for the state's image.
</state>	Indicates the end of the state element.
<state stateid="1">	Contains attributes for the object's second state, as well as elements for the state's caption and image.
<caption />	Contains attributes for the state's caption.
<imageSettings />	Contains attributes for the state's image.
</state>	Indicates the end of the state element.
</states>	Indicates the end of the states element.
<connections>	Contains a connection element for each connection assigned to the object.
<connection name= "Value" />	Contains attributes for the Value connection.
<connection name= "Indicator" />	Contains attributes for the Indicator connection.
</connections>	Indicates the end of the connections element.
</*object2*>	Indicates the end of the *object2* element.
</gfx>	Indicates the end of the gfx element.

You can specify multiple attributes for an element. For example, the caption element contains 13 possible attributes.

Elements for group objects begin with **<group>** and end with **</group>**. The <group> element contains all the elements for each object in the group.

For more information about graphic object elements and their attributes, see Help for the Graphics Import Export Wizard.

Symbols
.bmp files 20
   importing 21
   location of 21
   placing in graphic displays 14
   tips for using 25
   viewing 23
.dxf files 20
   placing in graphic displays 21
.jpg files 20
   importing 21
   placing in graphic displays 14
   tips for using 25
   viewing 23
.mea files 11
.med files 1
.mer files 2
   comparing 8
   converting to .med 4, 7
   creating 3
   transferring
      from PanelView Plus or PanelView Plus CE 7
      to PanelView 1, 6
      to PanelView Plus CE 1, 6
      to personal computers 1, 3
.wmf files 20
   placing in graphic displays 21
.xml files 4, 5, 1
Numerics
21 CFR Part 11 compliance 5
A
A.I. 5 tags
   importing 11
AB_DF1-1

using to transfer applications 5
AB_ETH-1
using to transfer applications 6
Acknowledge alarm button graphic object 7, 16
using with alarm objects 8, 36
Acknowledge all alarms button graphic object 8, 16
using with alarm lists 36
ActiveX objects 2
animating 2
at run time 17, 18
creating 21
navigating to 7
using to display tag values 6, 9
using to set tag values 5, 9
Addressing syntax
for HMI tags 5
Logix5000 6
Adobe Reader 1
ALARM BANNER display
editing 26
Alarm banner graphic object 9, 61
at run time 33, 19
linking buttons to 9
navigating to 7
specifying time and date format for 17
using buttons with 36
ALARM display 6
editing 25
window size 14
Alarm display
opening and closing 25, 31
remotely 25
Alarm Import Export Wizard 1
Alarm list graphic object 9, 60

at run time 32, 19
linking buttons to 9
navigating to 7
specifying time and date format for 17
using buttons with 36
Alarm log file 3, 10
deleting at application startup 16
printing contents of 10
Alarm messages
embedded variables in 2
exporting to XML 1
handshaking 21
importing XML 3
multiple languages for 5, 17
printing at run time 10
viewing at run time 19
ALARM MULTI-LINE display 6
copying 30
editing 27
Alarm Setup editor 3
exporting to XML 1
importing XML 3
using tags in 9
Alarm status list graphic object 9, 62
at run time 34
linking buttons to 9
navigating to 7
using buttons with 36
Alarm status mode button graphic object 7, 16
using with alarm status lists 36
Alarm triggers 5
and the default language 5
data types for 11
exporting to XML 1

importing XML 3
Alarms 1
acknowledging 8, 19, 38
remotely 19, 21, 24
clearing 8, 40
creating your own display for 31
deleting 40
displaying 6
displaying in the alarm status list 41
expressions in 4
filtering 5
handshaking 18
for remote acknowledgements 21
importing and exporting 4, 5
keeping a permanent record of 6, 10
notification methods for 6
planning 6
printing 10
queueing 18
resetting status of 9, 25, 40
remotely 25
responding to 7
retaining status of 41
sending messages to the data source 23
setting up 2
silencing 9, 24, 39
remotely 24
sorting 9, 40
testing on the development computer 2
Analog tags 1
how floating-point values are rounded 2
logging values for 4
monitoring for alarms 4
using to generate a range of alarms 11

Animation 1
   checking 16
   copying 18
   defining range of motion for 7
   for global objects 18, 13
   for group objects 45, 16
   setting minimum and maximum values for 6
   testing 5
   viewing in Object Explorer 25
   using expressions 6
   using Object Smart Path 4, 7
   using tags and placeholders 5
Animation dialog box 2
Animation types 1
   color 10
   fill 13
   height 14
   horizontal position 13
   horizontal slider 15
   rotation 14
   vertical position 14
   vertical slider 15
   width 14
   visibility 9
Application Explorer 4, 5
   showing and hiding 8
   using 8
Application files
   converting from runtime to development 4, 7
   deleting from disk 4
   viewing location of 18
Application Manager 10
   converting .mer files to .med files 7
   security for 10

Application properties
viewing 18
Application text
exporting for translation 6
importing 13
translating in Excel 9
translating in Unicode 9
Applications 1
backing up and restoring 10
closing 10
comparing 8
converting
PanelBuilder 1
PanelBuilder 1400e 1
PanelBuilder 32 1
copying, deleting, and renaming 10
creating 4
importing
PanelBuilder 1
PanelBuilder 1400e 1
PanelBuilder 32 1
multiple version support for 10, 1
opening 7
multiple 9
problems with 9
planning 1
runtime, creating 3
sample, granting users access to 2
sample, opening 2
security for 18, 19, 20
specifying language for 5, 4, 3
testing on the development computer 2
transferring from PanelView Plus or PanelView Plus CE 7
transferring to PanelView Plus or PanelView Plus CE 6

versus projects 1
using earlier versions of FactoryTalk View 1
using earlier versions of RSView 10
Arc graphic object 3, 16
Arithmetic operators
in expressions 6
evaluation order of 10
Array tags 15
data types for 15, 16
Arrow images 21
Audiences
for diagnostics messages 4
Auto repeat 11
AutoCAD files
See .dxf files
Automatic logout 13, 23
B
Background Color toolbar 31
Background style
transparent 21
Backing tags 6, 14
Backspace button graphic object 6, 16, 49
Bar graph graphic object 5, 44, 46
at run time 18
using animation to create 11
using with recipes 11
Base objects
breaking links to 14
creating 11
deleting 14
editing 12
Bit arrays
using to generate alarms based on priority sequence 13
using to generate multiple alarms 12

Bit trigger type 12
Bitmap files
   See .bmp files
Bitwise operators
   in expressions 8
      evaluation order of 10
Bounding box 5
Button graphic objects
   bounding box 5
   creating touch margins for 4
   linking to specific objects 9
   repeating button presses 11
   selecting objects to send button presses to 7, 9
   using function keys with 5
   using with alarm banners 6, 8
   using with alarm history and diagnostics messages 8
   using with lists 6
   using with numeric input objects 6, 8
   using with trends 6, 8, 11
Button presses
   repeating 11
   sending to graphic objects 7, 9
C
Caches for data servers
   synchronizing 5
Change Password window 5
Circle graphic object 3, 17
Clear alarm banner button graphic object 8, 7, 16
   using with alarm banners 36
Clear alarm history button graphic object 8, 16
   clearing alarms with 8
   resetting alarms with 9
   silencing alarms with 9
   using to delete the alarm log file 10

using with alarm lists 36
Close display button graphic object 3, 36
and alarms 31
and diagnostics messages 12
and information messages 6, 7
using to navigate 3, 6
Closing On Top displays 6
Color
blinking 1
for graphic objects 31
in graphic displays
animating 10
in trends 9
Color animation 6, 10
at run time 18
Communication drivers
setting up at run time
for transfer to PanelView Plus 4
for transfer to PanelView Plus CE 4
on personal computers 9
setting up in RSLinx Enterprise
at run time 9
for transfer to PanelView Plus 5
for transfer to PanelView Plus CE 5
Communications
displaying errors at run time 20
setting up 1
testing on the development computer 2
Compact Machine Edition application 1, 4, 3
project settings 15
Components 11, 1
adding into applications 3
file locations 2
printing 13, 5

security for 18
working with 1
Connections 2
assigning to graphic objects 34
using the Property Panel 30
expressions 2
for alarms 5, 17, 23
tags 2
Constants
in expressions 6
Context menus 6
Control list selector graphic object 5, 49
at run time 17
differences from piloted control list selectors 51
linking buttons to 9
navigating to 7
using Enter key handshaking with 12
Current trends 5, 2
D
Data log files 3, 1
Data log models
changing the model to use at run time 4
deleting tags from 4
Data Log Models editor 2
using tags in 12
Data logging 1
choosing the data to log 4
methods 3
problems with 5
setting up 1
storage locations 3
to monitor memory usage 8
Data server tags 1
browsing for 5

how to use 3
when to use 3
Data servers 8, 1, 2
creating 4
synchronizing caches for 5
Data sets, for recipes 1
comparing 8
printing 9
Data source
ensuring values are read by 12
for alarms 3
for HMI tags 5
for information messages 3
for local messages 28
for tags 2, 5
for trends 2
Default graphic displays
ALARM display 6
DIAGNOSTICS display 11
INFORMATION display 6
Default language 2
and alarm triggers 5
DEFAULT user 4
at runtime 3
DeskLock tool 2, 17
Device shortcuts
editing at run time 6
Device tags 5
addressing syntax for 5
Diagnostics clear all button graphic object 8, 16
using with diagnostic lists 13
Diagnostics clear button graphic object 7, 16
using with diagnostics lists 13
DIAGNOSTICS display 11

at run time 19
opening and closing 12
window size 14
Diagnostics List 5
clearing messages in 5
displaying 5
moving 5
resizing 5
showing and hiding 8
using to test displays 10
Diagnostics list graphic object 9, 64
at run time 12, 19
displaying communication errors in 20
linking buttons to 9
navigating to 7
using buttons with 13
Diagnostics List Setup editor 8
Diagnostics messages 1
audiences for 4
creating your own display for 11
displaying at run time 8, 19
displaying during application development 5
logging from PanelView Plus and PanelView Plus CE terminals 6, 8
logging to an ODBC database 7
message severity 4
ODBC format for 1
printing at run time 8
setting up at run time 10
setting up destinations for 6
setting up message routing for 6, 8
viewing log files 5
Diagnostics Setup tool 6
Diagnostics Viewer tool 6
Digital tags 1

logging values for 4
monitoring for alarms 4
DIN symbols 21
Display editor
See Graphic Displays editor
Display list selector graphic object 3, 37
linking buttons to 9
navigating to 7
using parameter files with 3
using to navigate 3, 6
Display number
specifying 4, 5
Display print button graphic object 31, 3, 16
printing trend data with 12
using the data source instead of 5
Display Settings dialog box 11
exporting to XML 1
importing XML 3
Display size
See Window size
Display types 12
and navigation 4
default 3
Displays
See Graphic displays
Documentation for FactoryTalk View
finding 1, 2
printing 1
Drawing objects 1
animating 2
coloring 32
creating 12
flipping 52
locking into position 53

reshaping 43
rotating 52
Drivers
See Communication drivers
E
Edit mode 10
Editor types
Alarm Setup 3
Data Log Models 2
Diagnostics List Setup 8
Expression 2
Global Connections 2
Graphic Displays 3
Graphic Libraries 16
Images 22
Information Messages 2
Information Setup 3
Local Messages 27
Parameters 5
Project Settings 17
RecipePlus Editor 6, 8
RecipePlus Setup 5
Runtime Security 3
Editors
printing in 13, 5
working with 10
Ellipse graphic object 3, 17
Embedded variables 1
displaying at run time 7
in title bars 12
syntax for 3
types of values 1
updating at run time 6
End button graphic object 6, 16, 49

using with alarm objects 38
using with diagnostics lists 13
using with recipes 12
using with trends 11
Enter button graphic object 6, 16, 49
and Enter key handshaking 12
using with alarm objects 8, 38
using with recipes 12
Enter key handshaking 12
Error messages
See
Diagnostics messages
Problems at run time
Exporting
alarm files 4, 1
global object displays 1
graphic displays 5, 1
problems with 8
text for translation 6
Expression editor 2
using tags in 5
Expression results
rounding 1
types of values 2
Expressions 1
and animation 6
assigning to connections 11
assigning to graphic objects 34
using the Property Panel 30
constants in 6
evaluation order of operators 10
formatting 4
if-then-else logic in 16
language function in 14

math functions in 13
monitoring for alarms 4
operators in
arithmetic 6
bitwise 8
logical 7
relational 7
security functions in 14
tags and placeholders in 5
viewing in Object Explorer 25
write expressions 18
F
Faceplates
See Process faceplates
Factory Talk Local Directory
restoring from runtime computer to development computer 7
FactoryTalk
loading directory of users and security policies 5
logging in 3
at runtime 3
single sign-on 22
turning off warning 16
FactoryTalk Diagnostics 1
setting up
on a personal computer 8
See also Diagnostics messages
FactoryTalk Diagnostics Viewer tool 6
viewing diagnostics log files in 5
Windows Event Viewer 5
FactoryTalk Directory
security access to 19
FactoryTalk Security 1
permissions for converting runtime applications to development applications 7

setting up 15
turning off 2
users, creating 17
FactoryTalk View
FactoryTalk View ME Station 1
FactoryTalk View Studio 1
FactoryTalk View Machine Edition 1
FactoryTalk View ME Station
exiting 5
starting
on PanelView Plus CE terminals 3
on PanelView Plus terminals 3
on personal computers 4, 12
supported versions 10, 1
FactoryTalk View Studio
main window 4
starting and exiting 1
FactoryTalk View tags
importing 11
File names 2
and spaces 4
maximum length of 4
Fill animation 6, 13
at run time 18
Folders 7
Fonts
for multiple languages 12
in graphic displays
substitution at run time 12
in trends 9
transferring 6
Foreground Color toolbar 31
Freehand graphic object 3, 17
Function keys

assigning to graphic objects 5
G
Gauge graphic object 5, 44, 47
at run time 18
specifying number format for 17
Global connections 1
setting up 2
use to apply parameter files or lists 6
using to change displays remotely 4, 5, 7
using to close On Top displays 6
using to monitor memory usage 7
using to print displays remotely 5
using to run macros 6, 3
Global Connections editor 2, 31
Global object displays
creating 11
exporting to XML 1
importing XML 3
Global objects
animating 18, 13
creating 11, 12
exporting to XML 1
importing XML 3
See also Base objects
See also Reference objects
Goto configure mode button graphic object 4, 16
using to navigate 3
Goto display button graphic object 3, 35
and alarms 31
and diagnostics messages 12
and information messages 7
assigning visibility animation to 24
using parameter files with 3
using to navigate 3, 4

Graphic displays 1
changing remotely 4, 7
security issues 4
setting up 5
when a user logs out 23
using global connections 4
creating 3
creating a background for 13
default
ALARM 6
DIAGNOSTICS 11
INFORMATION 6
developing a hierarchy for 1
exporting to XML 1
illustrating 3
importing XML 3
limiting access to 9
maximum number licensed to use 18
navigating between 1
objects for 3
testing navigation 3
numbering 4, 5
opening 4
planning 3, 2
printing 30
at run time 30
remotely 5, 31
setting up printer 10
setting up 11
sizing 12, 13
testing 10
animation 5
title bar in 15
types of 12

default type 3
viewing in detail 9
using parameter files with 2
Graphic Displays editor 3
undoing and redoing actions in 10
using tags in 9
Graphic images
importing 20
monochrome 21
that come with FactoryTalk View Studio 21
viewing 23
Graphic libraries 14
ALARM BANNER display 26
ALARM MULTI-LINE display 6, 26, 27
changing file location for 19
copying 30
creating 16
HISTORY display 6, 29
opening 16
RecipePlus_Components library 11
saving with multiple languages 17
setting up for multiple languages 15
Sliders library 15
STATUS display 6, 28
Trends library 10
Graphic Libraries editor 16
Graphic object types
acknowledge alarm button 7, 16
acknowledge all alarms button 8, 16
ActiveX objects 2, 21
alarm banner 9, 61
alarm list 9, 60
alarm status list 9, 62
alarm status mode button 7, 16

backspace button 6, 16, 49
bar graph 5, 44, 46
clear alarm banner button 7, 16
clear alarm history button 8, 16
close display button 3, 36
control list selector 5, 49
diagnostics clear all button 8, 16
diagnostics clear button 7, 16
diagnostics list 9, 64
display list selector 3, 37
display print button 3, 16
drawing objects 1
   arcs 3, 16
   circles 3, 17
   ellipses 3, 17
   freehand objects 3, 17
   images 3, 14
   lines 3, 17
   panels 3, 15
   polygons 3, 18
   polylines 3, 18
   rectangles 3, 19
   rounded rectangles 3, 19
   squares 3, 19
   text 3, 12
   wedges 3, 16
end button 6, 16, 49
enter button 6, 16, 49
gauge 5, 44, 47
goto configure mode button 4, 16
goto display button 3, 35
home button 7, 16, 49
information acknowledge button 7, 16
information message display 9, 65

interlocked push button 4, 25
language switch button 3, 16
latched push button 4, 22
list indicator 6, 42
local message display 9, 54
login button 3, 16
logout button 3, 16
macro button 56
maintained push button 4, 21
momentary push button 4, 19
move down button 7, 16, 49
move left button 7, 16
move right button 7, 16
move up button 7, 16, 49
multistate indicator 5, 39
multistate push button 4, 24
next pen button 6, 16
numeric display 8, 28
numeric input cursor point 8, 31
numeric input enable button 8, 30
page down button 7, 16, 49
page up button 7, 16, 49
password button 3, 16
pause button 6, 16
piloted control list selector 5, 51
print alarm history button 4, 58
print alarm status button 4, 59
ramp button 5, 27
RecipePlus button 9, 16, 3
RecipePlus selector 9, 2
RecipePlus table 9, 2
reset alarm status button 16
reset alarm status mode button 8
return to display button 3, 16

scale 5, 44, 48
shutdown button 4, 16
silence alarms button 8, 16
sort alarms button 8, 16
string display 8, 33
string input enable button 8, 34
symbol 5, 41
time and date display 6, 57
trend 6
Graphic objects 1
aligning 49
animating 2
arranging 47, 51
assigning connections to 34
using the Property Panel 30
coloring 31
converting to wallpaper 13
copying 40
creating 11, 12
selecting tools for 10
deleting 44
deselecting 23
duplicating 41
editing 38
embedded variables in 2
exporting to XML 1
grouping and ungrouping 45
importing XML 3
moving 39
naming 32
navigating between 7
positioning 48
with grid 8
replacing tags and expressions in 36

resizing 42
selecting 23
setting up 1
using the Properties dialog box 26
using the Property Panel 29
spatial properties of 2
time, date, and number formats 15
visibility, setting up 2
using at run time 4
using keys to work with *See* Special keys
using to display alarms and messages 9
using to display processes 5
using to enter and display numeric and string values 8
using to illustrate displays 3
using to navigate 3
using to start and control processes 4
Grid
in graphic displays 8
in trends 9
Group objects
animating 45, 16
creating 45
editing 46
naming 33
H
Handshaking
Enter key 12
for Alarm messages 21
for alarms 18
remote 21
Height animation 6, 14
at run time 18
Historical trends 5, 2
HISTORY display 6

editing 29
HMI servers 8, 9, 1
HMI tags 2, 1
addressing syntax for 5
browsing for 5
creating 8
data sources 5
exporting 11
how to use 5
importing 9, 11
merging databases 11
naming 7
searching for 4
when to use 4
See also
Analog tags
Device tags
Digital tags
Memory tags
String tags
System tags
Home button graphic object 7, 16, 49
using with alarm objects 38
using with diagnostics lists 13
using with recipes 12
using with trends 11
Horizontal position animation 6, 13
at run time 18
Horizontal slider animation 6, 7, 15
at run time 17
J
If-then-else logic
in expressions 16
nesting 17

Image Browser 23
Image graphic object 3, 14
Images editor 22
Importing
   alarm files 4, 3
   applications 6
   global object displays 3
   graphic displays 5, 3
   tags 11
Importing application text 13
   problems with 14
Indicators 39
Information acknowledge button graphic object 7, 16
   at run time 7
INFORMATION display 6
   at run time 19
   opening and closing 7
   window size 14
Information message display graphic object 9, 65
   at run time 19, 7
Information message files 2, 4
   changing the file to use at run time 8
Information messages 1
   creating your own display for 7
   displaying 3
   embedded variables in 2
   multiple languages for 5
   setting up 1
   viewing at run time 19
Information Messages editor 2
Information Setup editor 3
Ingredients, for recipes 1
Initial values for tags 12, 1
   See also Tag values

Input focus
   giving to graphic objects 7
Interlocked push button graphic object 4, 25
   at run time 16
ISA symbols 21
Isolated graphing
   in trends 8
K
KEPServerEnterprise
   array tag syntax 17
Keyboard button symbols 21
Keyboard navigation 7
L
Language function
   in expressions 14
Language strings
   exporting for translation 6
   importing 13
   translating in Excel 9
   translating in Unicode 9
Language switch button graphic object 4, 3, 16
   placing in displays 3
   planning 5
Language switching 1
   See also Languages
   setting up 3
   setting up Windows for 4
Languages
   adding 5
      to libraries 17
   choosing fonts for 12
   default 2
   displaying current language 14
   planning 5

display navigation 3
RFC1766 names 1
setting up in runtime application 6
setting up messages
alarm 5, 17
for RSView ME Station 4.00 15
information 5
local 30
testing 2
Latched push button graphic object 4, 22
at run time 16
Least Significant Bit trigger type 13
Libraries
See Graphic libraries
License
viewing maximum allowable graphic displays 18
Line graphic object 3, 17
Link properties
for reference objects 13
List indicator graphic object 6, 42
at run time 18
Local message display graphic object 28, 9, 54
at run time 19, 30
using with message files 26
Local message files 27, 28
Local messages 26
embedded variables in 2
multiple languages for 30
viewing at run time 19
Local Messages editor 27
Localizing applications
importing text 13
information for translators 9
new line character 13

problems importing text 14
Unicode file schema 11
Log files
ODBC format for diagnostics messages 1
LOGIC 5
See WINtelligent LOGIC 5 tags
Logical operators
in expressions 7
evaluation order of 10
Login button graphic object 3, 16
locating in display hierarchy 1
logging in with 12
Login macro 2, 4
assigning to RSView 3.20 and earlier users 7
assigning to users 5
running 3, 6
Login window 2
Logix5000 faceplates
See Process faceplates
Logix5000 processors 2
addressing syntax for 6
creating tags in 3
Logout button graphic object 3, 16
locating in display hierarchy 1
logging out with 12
Logout macro 2, 4
assigning to RSView 3.20 and earlier users 7
assigning to users 5
running 3, 6
LSBit trigger type 13
M
Macro button graphic object 56
using to run macros 2
Macros

creating 1
remote
running from the data source 6, 3
Macros editor 12
Maintained push button graphic object 4, 21, 19
at run time 16
Math functions
in expressions 13
Memory tags 5
using 4
Memory usage
monitoring at runtime 7
Menus
in the Graphic Displays editor 6
Message severity
for diagnostics messages 4
Messages
displaying 9
multiple languages for
in RSView ME Station 4.00 15
planning 6
See also
Alarm messages
Diagnostics messages
Information messages
Local messages
Microsoft Access
logging to 7
Microsoft Excel
exporting text strings to 6
translating text strings in 9
Microsoft SQL Server
logging to 7
Minimum and maximum values

for animation 6
for HMI tags 4
for trends 6
Modicon devices 1
Momentary push button graphic object 4, 19
at run time 15
Monochrome images 21, 5
Move down button graphic object 7, 16, 49
setting up auto repeat for 11
using with alarm objects 38
using with diagnostics lists 13
using with recipes 12
using with trends 11
Move left button graphic object 7, 16
setting up auto repeat for 11
using with trends 11
Move right button graphic object 7, 16
setting up auto repeat for 11
using with trends 11
Move up button graphic object 7, 16, 49
setting up auto repeat for 11
using with alarm objects 38
using with diagnostics lists 13
using with recipes 12
using with trends 11
Multistate graphic objects
coloring 31
setting up 3
testing states 33
Multistate indicator graphic object 5, 39
at run time 18
using with recipes 11
Multistate push button graphic object 4, 24
at run time 16

setting up auto repeat for 11
N
Navigation
between graphic displays 1
testing 3
between graphic objects in a display 7
Next pen button graphic object 6, 16
using to change trend’s vertical axis labels 6, 11
Normally closed push button 19
Normally open push button 19
Number format
at run time 17
Numeric display graphic object 8, 28, 10
at run time 17
specifying number format for 17
Numeric embedded variables 3
at runtime 7
Numeric input cursor point graphic object 8, 31
at run time 16, 17
navigating to 7
using Enter key handshaking with 12
Numeric input enable button graphic object 8, 30
at run time 6, 16
how values are calculated 9
how values are ramped 9
navigating to 7
using Enter key handshaking with 12
using write expressions with 18
Numeric pop-up windows
using at run time 7, 8
Numeric values
ramping at run time 7
using graphic objects to display and enter 8

O
Object Explorer 24
   opening 24
   viewing animation in 25
   viewing tag and expression assignments in 25
   using to highlight objects 25
Object Smart Path 4, 7
ODBC storage format
   for diagnostics messages 1
Off-line tags
   browsing for 7
On Top displays 12
   sizing 13
   using for alarms 31
   using for diagnostics messages 11
   using for information messages 7
OPC communications
   and RSLinx Classic 1
   setting up 1
   using to connect to Logix5000 processors 6
OPC servers, items in 6
OPC tags
   addressing syntax for 5
open Symbol Factory, Symbol Factory 15
Operators
   in expressions 6
Oracle
   logging to 7
P
Page down button graphic object 7, 16, 49
   setting up auto repeat for 11
   using with alarm objects 38
   using with diagnostics lists 13
   using with recipes 12

Page up button graphic object 7, 16, 49
   setting up auto repeat for 11
   using with alarm objects 38
   using with diagnostics lists 13
   using with recipes 12
Panel graphic object 3, 15
PanelBuilder 1400e applications
   converting 1
PanelBuilder 32 applications
   converting 1
PanelBuilder applications
   converting 1
PanelView Plus CE terminals
   logging diagnostics messages from 6, 8
   transferring applications to 1
PanelView Plus terminals
   logging diagnostics messages from 6, 8
   running applications on 1
   transferring applications to 1
Parameter files 38, 2
   assigning to graphic displays 2
      using display list selectors 3
      using goto display buttons 3
   in global connections 6
Parameter lists
   creating 7
   in global connections 6
   in graphic objects 3
parameter passing 9
Parameters editor 5
   using tags in 5
Password button graphic object 3, 16
   using at runtime 5
Passwords

changing
at runtime 4
for RSView 3.20 and earlier users 7
for Windows users in RSView 3.20 and earlier applications 8
for FactoryTalk Security users
managing 21
uploading runtime changes to development application 7
Pause button graphic object 6, 16
using with trends 11
Piloted control list selector graphic object 5, 51
controlling remotely 52
differences from control list selectors 51
using Enter key handshaking with 12
Placeholders
See Tag placeholders
PLC tags
importing 9
Polygon graphic object 3, 18
Polyline graphic object 3, 18
Preconfigured graphic displays
ALARM display 6
DIAGNOSTICS display 11
INFORMATION display 6
Print alarm history button graphic object 4, 58
specifying time and date format for 17
using to print alarm information 10
using with alarm objects 37
Print alarm status button graphic object 4, 59
using to print alarm information 10
using with alarm objects 37
Printers
selecting on the development computer 14
specifying at run time on personal computers 10
type to use with PanelView Plus and PanelView Plus CE 1, 2

Problems at run time
communication errors
viewing 20
data logging 5
displaying numeric values 28
displaying trend data 12
logging in 4
printing from a PanelView Plus CE terminal 1, 2
printing from a PanelView Plus terminal 2, 3
using the numeric pop-up windows 10
using the string pop-up windows 15
Problems at runtime
memory usage 7
Problems during application development
exporting text for translation 8
importing alarm XML files 3
importing graphics XML files 3
importing text 14
navigating through displays 3
opening applications 3, 9
Process faceplates
adding to an existing application 17
selecting tags for 6
Project files
location of
viewing 18
Project Settings editor 17
Project window size 11, 12
changing 13
Projects
versus applications 1
Properties dialog box
opening 28
setting up objects in 26

using to assign connections to graphic objects 34, 36
Property Panel
opening 29
setting up objects in 29
using to assign connections to graphic objects 30
Push buttons 18
R
RAM usage
monitoring at runtime 7
Ramp button graphic object 5, 36, 27
at run time 16
setting up auto repeat for 11
Range of motion
for animation 6, 7
Read connection 30
Read-write connection 30
Real-time trends
See Current trends
Recipe files
setting up 6
specifying location for 5
RecipePlus 1
RecipePlus button graphic object 9, 16, 3
creating 10
using at runtime 16, 18, 12
RecipePlus Editor 6, 8
viewing runtime data in 13
RecipePlus selector graphic object 9, 2
creating 10
linking buttons to 9
navigating to 7
using at runtime 16, 18, 12
RecipePlus Setup editor 5
RecipePlus table graphic object 9, 2

creating 10
linking buttons to 9
navigating to 7
using at runtime 16, 18, 12
Recipes 1
comparing 8
deleting units 3
displaying at runtime 2
downloading 3
editing at runtime 2
linking buttons to 12
number format 4
numeric limits 4
planning 7
printing 9
renaming units 3
saving at runtime 3
selecting at runtime 2
setting up 2
testing 10
time and date formats 9
viewing data for 7, 13
uploading 3
Rectangle graphic object 3, 19
blinking 11
Reference objects
creating 12
editing 13
link properties 13
Relational operators
in expressions 7
evaluation order of 10
Remote display changes 4, 23
Remote macros 6, 3

Replace displays 12
   sizing 13
Reset alarm status button graphic object 8, 16
   using to reset alarms 9
   using with alarm status lists 37
Return to display button graphic object 3, 16
   using to navigate 3, 5
RFC1766 names 1
Right-click menus 6
Rotation animation 6, 52, 14
   at run time 18
Rounded rectangle graphic object 3, 19
RSLinx Classic 1
   and OPC 1
RSLinx Enterprise 1
   array tag syntax 16
   device shortcuts created at runtime 3, 7
   setting up drivers in
      at run time 9
      for transfer to PanelView Plus 5
      for transfer to PanelView Plus CE 5
RSLogix 5 tags
   importing 11
RSLogix 500 tags
   importing 11
RSLogix 5000 2
Runtime
   changing tag values 15
   deleting log files 16
   displaying tag values 17
   entering numeric values 6
   entering string values 10
   font substitution 12
   logging in and out 2, 6

automatic logout 13
problems with logging in 4
printing 15
graphic displays 30
printing graphic displays 30
setting up communication drivers on personal computers 9
setting up printers on personal computers 10
switching language at 3
time, date, and number formats 17
viewing alarms and messages 19
viewing communication errors 20
using graphic objects 4
Runtime application
.mer files 1
converting to development application 4, 7
opening 4
on personal computers 4, 12
running
on PanelView Plus CE terminals 3
on PanelView Plus terminals 3
on personal computers 4
shutting down 5
transferring
from PanelView Plus or PanelView Plus CE 7
to PanelView 1, 6
to PanelView Plus CE 1, 6
to personal computers 1, 3
Runtime application file
creating 3
Runtime RAM usage
monitoring 7
Runtime screen resolution 11
Runtime Security editor 3

S
Sample applications 2
Scale graphic object 5, 44, 48
Screen resolution
   at run time 11
Screen size
   See Window size
Security
   and remote display changes 4
   automatic logout 13
   controlling who can stop the application 14
   FactoryTalk Security 1
   FactoryTalk View security 1
   for Application Manager 10
   logging in and out 12
   planning 7
   setting up 17
   using visibility animation 14, 24, 9
Security codes
   assigning to graphic displays 9
   assigning to RSView 3.20 and earlier users 7
   assigning to users 5, 9
Security functions
   in expressions 14
   using 11, 24, 9
Serial downloads
   cable to use for 6
Servers, data 2
   See also OPC servers
Shutdown button graphic object 4, 16
   assigning visibility animation to 24, 25
   limiting access to 14
   locating in display hierarchy 1
   using to navigate 3, 7

using to shut down application 5
using to stop application 2
Shutdown macro 2, 4
Siemens devices 1
Silence alarms button graphic object 9, 8, 16
using with alarm objects 37
Single sign-on 22
SLC tags
importing 9
Sort alarms button graphic object 9, 8, 16
using with alarm lists 37
Special keys
arrows, using with graphic objects 43
Ctrl
copying objects with 40
drawing objects with 17, 18, 19, 20
resizing objects with 43
rotating objects with 53
selecting objects with 23
Shift, using with graphic objects 40, 43
using to navigate at run time 8
using with numeric pop-up windows 8
using with string pop-up windows 13
Spreadsheets, working in 12
Square graphic object 3, 19
Standard toolbar 5
Startup macro 2, 4
Startup settings 1
States
multistate graphic objects 1
States toolbar 33
Status bar 6
showing and hiding 8
STATUS display 6

copying 30
editing 28
String display graphic object 8, 33
at run time 17
String embedded variables 4
at runtime 8
String input enable button graphic object 8, 34
at run time 10, 16
how values are written 14
navigating to 7
using Enter key handshaking with 12
String pop-up character input
using at run time 11
String pop-up windows
using at run time 11, 13
String tags 1
String values
using graphic objects to display and enter 8
Structured tags 6, 14
Sybase SQL Server
logging to 7
Symbol Factory 14, 24
import into display 25
import into image container 24
Symbol graphic object 5, 41
at run time 18
Syntax, embedded variable 3
System activity
See Diagnostics messages
System tags 1
alarm reset date and time 1
for making graphic objects blink 1
time and date 2
System time and date 2

T
Tag Browser
   opening 5
   using 6
Tag Import and Export Wizard 11
Tag placeholders 37, 1, 4
   creating 38, 3
   using in expressions 5
   using with animation 5
Tag sets, for recipes 1
   comparing 8
Tag statistics
   viewing 8
Tag substitution 11, 36
Tag syntax
   for array tags
      KEPServerEnterprise 17
      RSLinx Enterprise 16
Tag values
   changing at run time 15
   displaying at run time 17
   ensuring the data source has read 12
   logging 12, 4
   using graphic objects to display 8
   using graphic objects to set 4, 8
   using macros to assign 12, 1
Tags 1
   addressing syntax 5
   assigning to graphic objects 34
      viewing in Object Explorer 25
      using the Property Panel 30
   assigning to parameter lists in global connections 6
   basic steps for using 2
   browsing for 5

limits, in graphic displays 1
off-line, browsing for 7
planning 2
using in expressions 5
See also
Analog tags
Array tags
Backing tags
Data server tags
Digital tags
HMI tags
PLC tags
SLC tags
String tags
Structured tags
System tags
Test mode
for animation 5
for graphic displays 10
for RecipePlus objects 10
for trends 10
Text graphic object 3, 12
blinking 11
editing 13
Text strings
exporting for translation 6
importing 13
translating in Excel 9
translating in Unicode file 9
Time and date
at run time 17
setting using global connections 2
system tags 2
updating 2

Time and date display graphic object 6, 57
   at run time 19
   specifying time and date format for 17
Time and date embedded variables 6
   at runtime 8
Title bar
   and security 14
   in graphic displays 15
Toolbars 4
   Background Color toolbar 31
   Foreground Color toolbar 31
   in the Graphic Displays editor 7
   showing and hiding 8
   Standard toolbar 5
   States toolbar 33
Tools
   Application Manager 10
   DeskLock 2, 17
   Diagnostic Setup 6
   Diagnostics Viewer 6
   Tag Import and Export Wizard 11
   Transfer Utility 6
Touch margins
   using on buttons 4
Touch screens
   positioning objects for 4
Transfer Utility tool 6
Translating application text
   in Excel 9
   in Unicode 9
Transparent background style 21
Trend data
   printing at run time 12
      remotely 12

Trend graphic object 6, 1
and data logging 5
at runtime 18
border 5
chart 6
isolated graphing in 8
types 7
XY Plot 7
coloring 9
creating 3
linking buttons to 9
minimum and maximum values for 6
navigating to 7
pens 6
icons 7
markers 7
planning 6
plotting values across the chart 8
problems at run time 12
setting up 3, 4, 5
specifying number, time, and date format for 17
testing 10
time, date, and number format 3
window 5
x (horizontal) axis 6
labels 6
y (vertical) axis 6
labels 6
Trigger Label Selector 5
Trigger values
for alarms 5, 11
for information messages 5
for local messages 29
Troubleshooting

See Problems at run time, Problems during application development
W
Wallpaper
converting graphic objects to 13
unlocking 14
Value table 2, 4, 5
Value trigger type 11
Wedge graphic object 3, 16
Vertical position animation 6, 14
at run time 18
Vertical slider animation 6, 15
at run time 17
Width animation 6, 14
at run time 18
Wildcard characters 4, 7
Window size
default graphic displays 14
project 12
Windows
setting up for language switching 4
Windows 2000, Windows XP, or Windows Server 2003 R2
editing device shortcuts on 6
running applications in 1
runtime settings 4
Windows languages 1
Windows metafiles
See .wmf files
Windows network domain
logging in to 1
Windows users or groups
adding to FactoryTalk Security 17, 19
adding to RSView 3.20 and earlier applications 7
removing from RSView 3.20 and earlier applications 8
WINtelligent LOGIC 5 tags

importing 11
Visibility animation 9
using to set up security 14, 24, 9
Unicode text
translating 9
Units, for recipes 1
Workbook Mode 7
turning on and off 8
Workspace 5
Write connection 30
Write expressions 18
User accounts
DEFAULT user 4
User groups
assigning security codes to 9
FactoryTalk Security, creating 19
Windows
adding to RSView 3.20 and earlier applications 7
Users
assigning login and logout macros to 5
assigning security codes to 5, 9
assigning security permissions to 18
displaying current user 14
FactoryTalk Security
adding to FactoryTalk View 5
creating 17
managing accounts 21
logging in and out 12, 6
at runtime 2
RSView 3.20 and earlier
assigning login and logout macros to 7
assigning security codes to 7
RSView 3.x
migrating to 4.00 and later applications 6

X
XML
   using with FactoryTalk View 1
XML files
   alarm structure 3
   creating 1
   editing 2
   exporting 1
   graphics structure 4
   importing 3
   testing 2
XY Plot trend 7